Railway Age

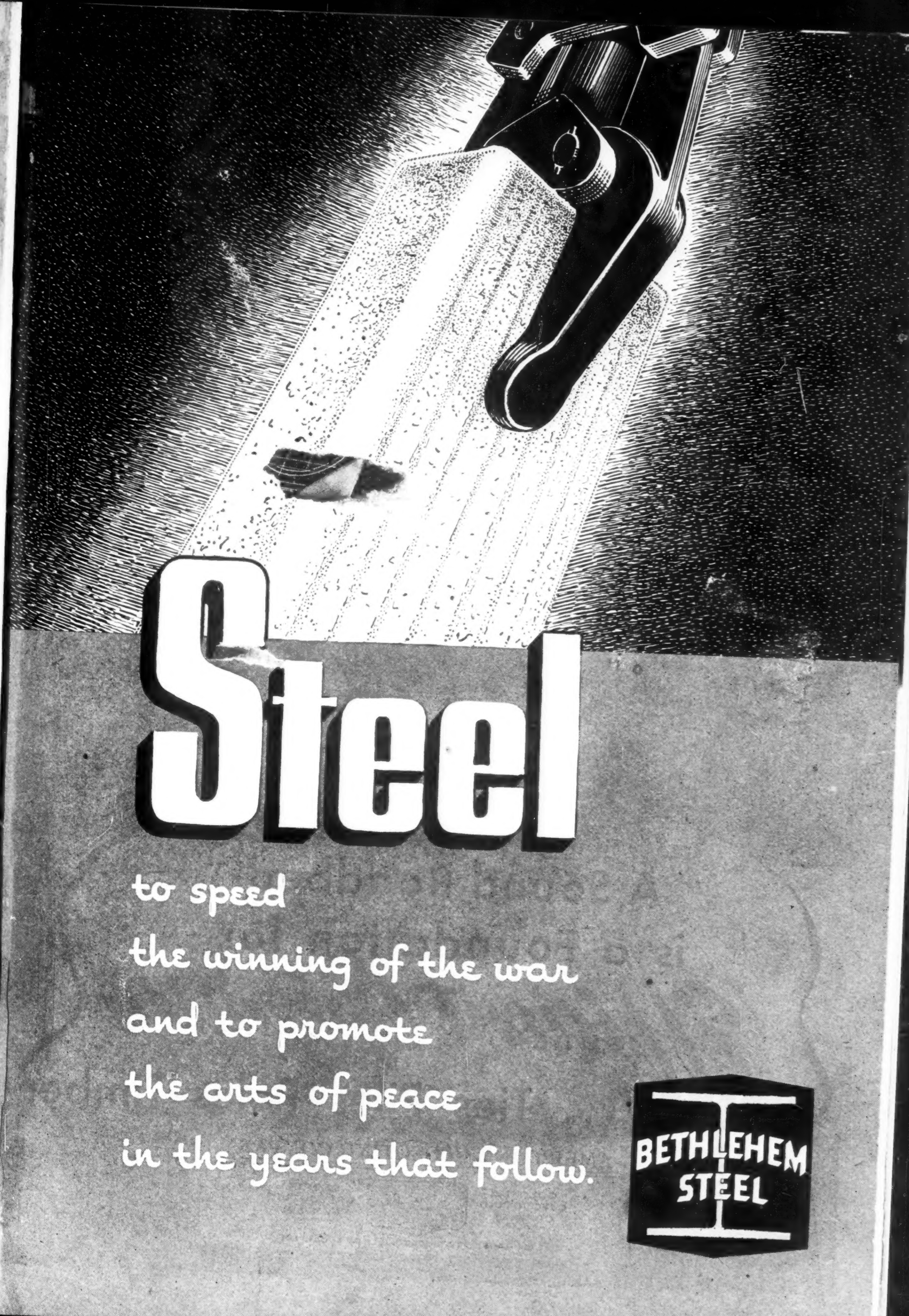

Year after Year, after Year
KERITE registers a gain in the gratitude of engineers at work in the railroads, utilities, and industries of the world—on control, power and electronic circuits.
They realize that KERITE'S eighty years experience as pioneers in Cable Engineering is the first step in gaining a solution of their problems.
1854-1945

Published weekly by Simmons-Boardman Publishing Corporation, 1309 Noble Street, Philadelphia, Pa. Entered as second class matter, January 4, 193 at the Post Office at Philadelphia, Pa., under the act of March 3, 1879. Subscription price $6.00 for one year U. S. and Canada. Single copies, 2 cents each. Vol. 118, No. 1.

of
heir
ors.
eels
ease
ons
is –
one
ican
ized
ght.

, 1933
ies, 2
ACE

ciation of
ave their
nspectors.
ar Wheels
no release
cifications
All this —
— is done
American
ndardized
or bought.


Steel
to speed
the winning of the war
and to promote
the arts of peace
in the years that follow.
BETHLEHEM
STEEL

DRAFTING BOARDS ARE LOADED
with plans to install proportioning feeders

Planning automatic water treatment plants that will meet the operating requirements of each railroad is 'round-the-clock work for Dearborn engineers these days.

Railroads now using Dearborn proportioners find water output can be increased 4 or 5 times normal capacity without changes or additions to equipment or without damaging effect upon the equipment already in use.

Peacetime operating will not tolerate high water costs

As Dearborn proportioners make possible the use of inexpensive auxiliary chemicals in combination with a Dearborn formula, water treatment costs are lower than with any type of "boiler compound" which includes a large proportion of soda ash as one of its chemicals.

Call us for details if your plan to improve your water treating facilities is not already on the Dearborn drafting board in our engineering department.

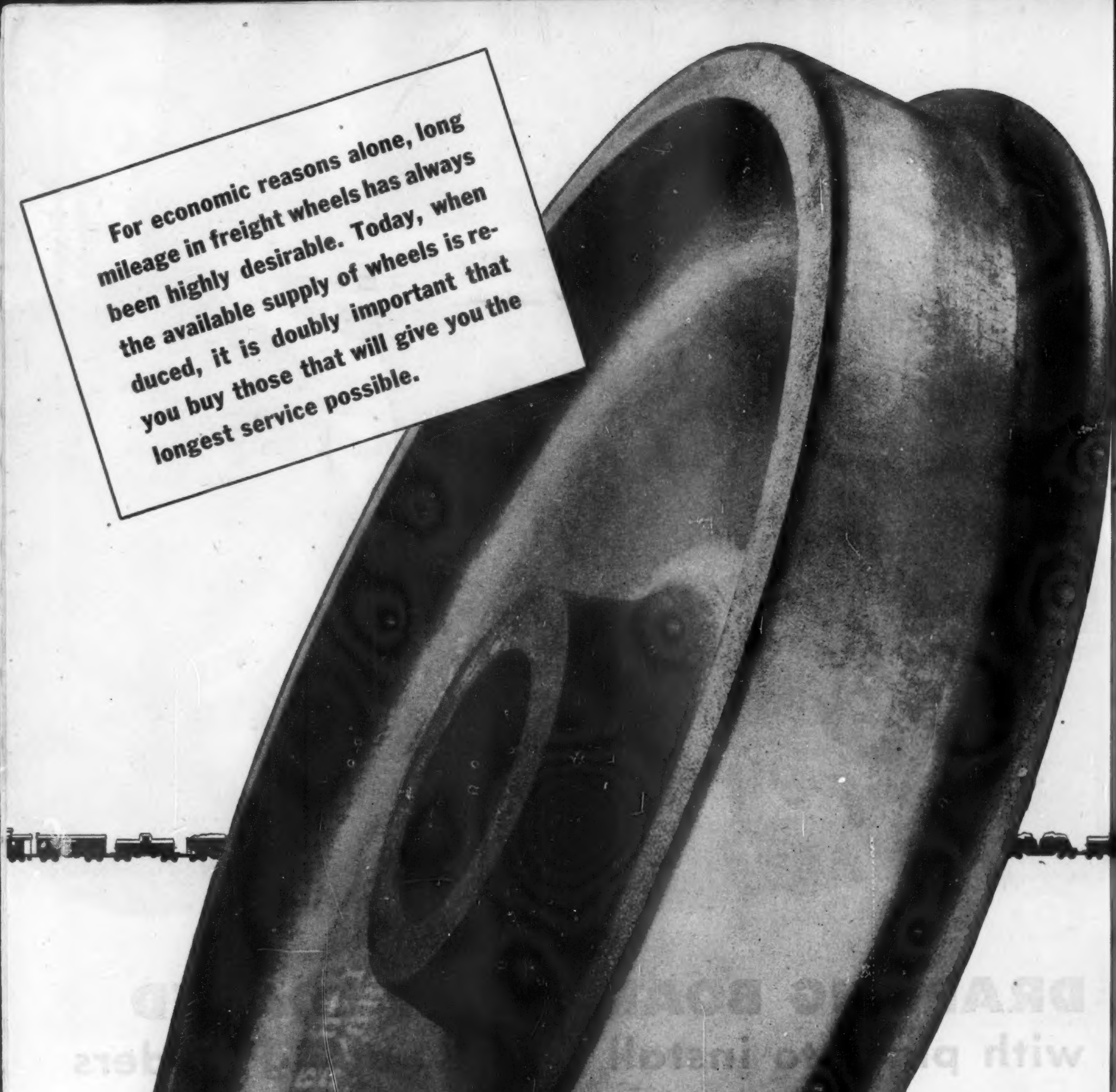
DEARBORN CHEMICAL COMPANY

310 S. Michigan Ave., Chicago 4 — 807-15 Mateo St., Los Angeles
205 E. 42nd St., New York — 2454 Dundas St., West, Toronto

Dearborn

TRADE MARK REGISTERED

BOILER WATER TREATMENT AND SERVICE



For economic reasons alone, long mileage in freight wheels has always been highly desirable. Today, when the available supply of wheels is reduced, it is doubly important that you buy those that will give you the longest service possible.
• HIGHER MILEAGE
• GREATER SAFETY
• LOWER COST
USS
STEEL
UNITED STATES STEEL
UNITED

7

238
Oct 17

U·S·S ONE-WEAR WROUGHT STEEL WHEELS

67

For superior service under heavy loads and high speeds

WHY are more than 80% of all 70-ton freight cars equipped with *Wrought Steel* Wheels? The answer is simple. It is because these wheels have proved that, under the most exacting freight service—where loads are heavy and speeds are high—they insure incomparably greater safety, fewer traffic interruptions, and cost less per mile to run.

They are the very good reasons why Wrought Steel Wheels are used under all of our high speed, de luxe passenger equipment—and why they are being increasingly used on 50-ton equipment of all types and on even lighter cars, especially refrigerators.

Today, nearly 2,000,000 U·S·S One-Wear Wrought Steel Wheels are in service on 91 railroads and 68 private lines.

Under 50/55-ton service they average 200,000 miles. Under 70-ton service, 160,000 miles. Many have gone well over the 300,000 mile mark; a few have run more than 400,000 miles.

The heavier loads now carried, the greater distances traveled, and the fast speed at which freight must move today and will have to move tomorrow, put a premium on freight wheel safety.

Because U·S·S One-Wear Wrought Steel Wheels have the ability to endure heavy brake action and impact at high speeds their safety factor is high. They stay in serviceable condition longer, keep cars off the repair track.

If you want to play safe in your planning for postwar competition, change over to U·S·S One-Wear Wrought Steel Wheels, now.

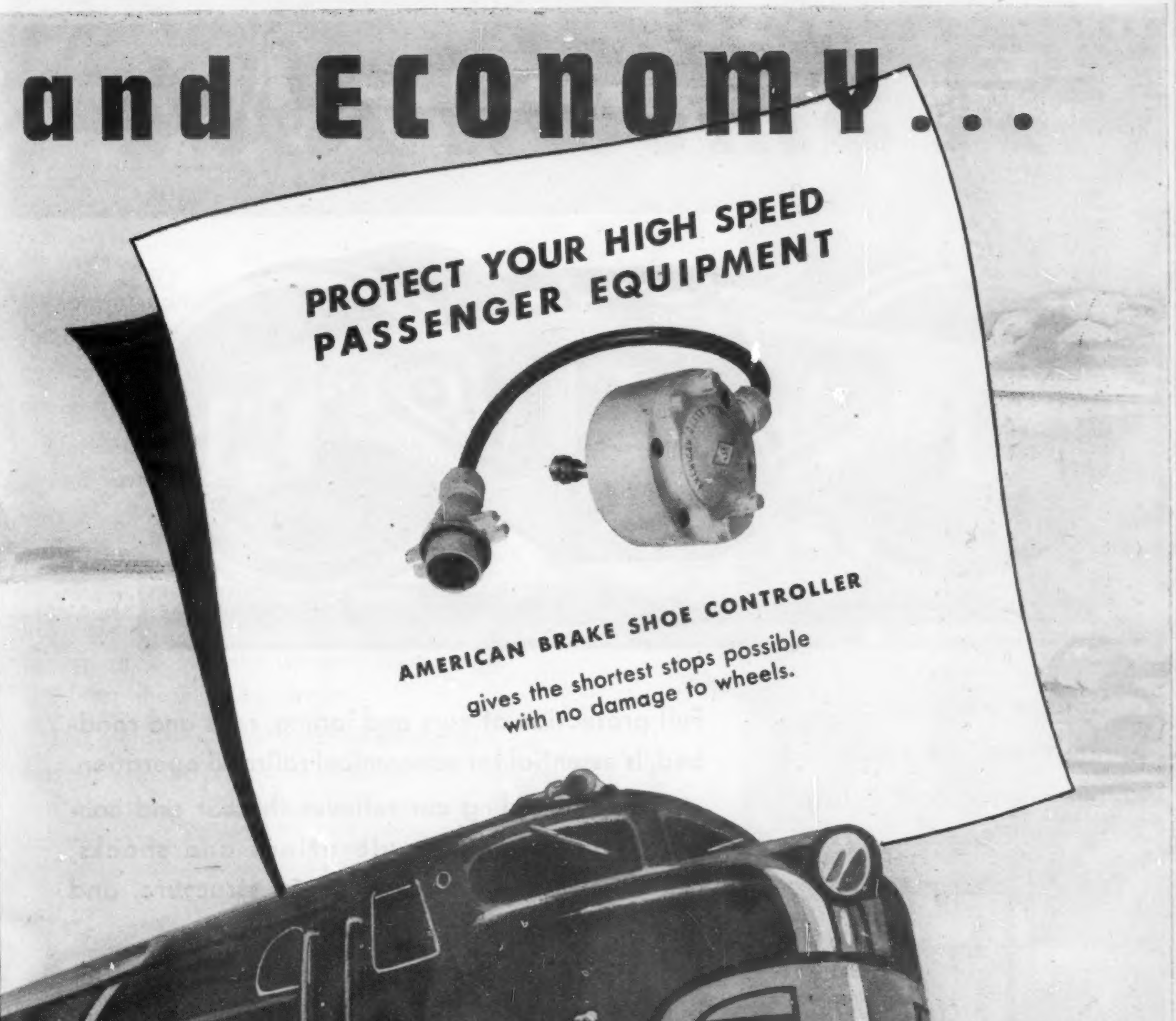
CARNEGIE-ILLINOIS STEEL CORPORATION

Pittsburgh and Chicago

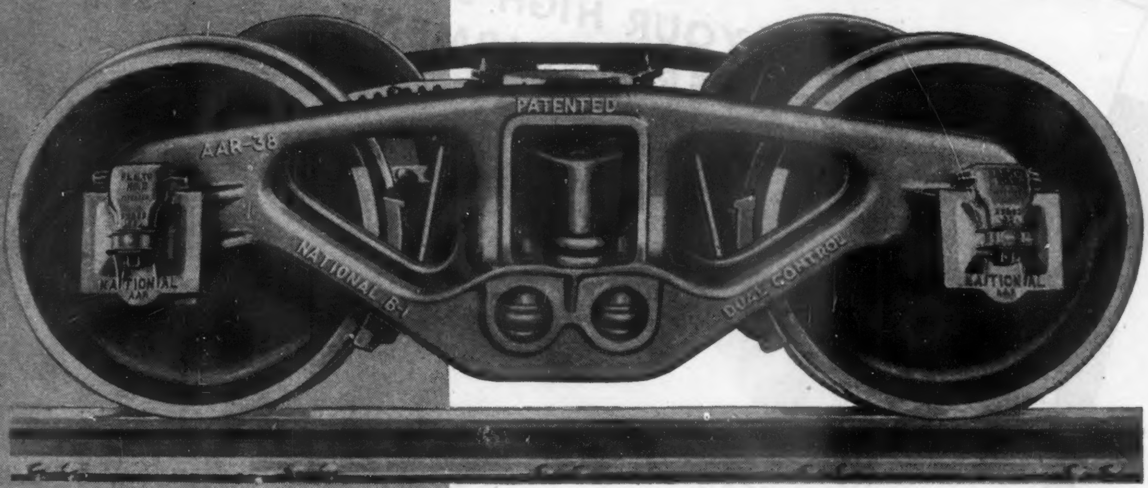
Columbia Steel Company, San Francisco, *Pacific Coast Distributors*
United States Steel Export Company, New York

STATES STEEL

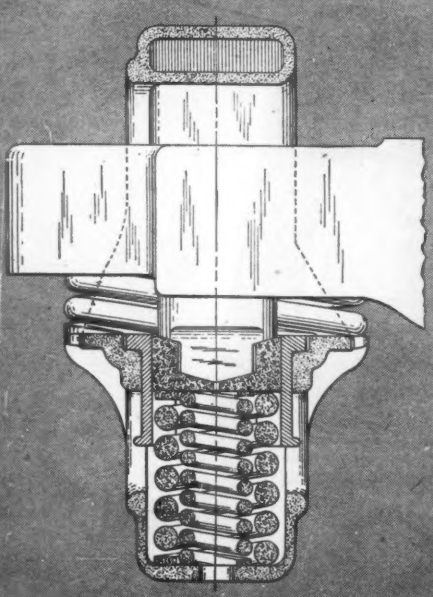

for SAFETY
NO MATTER HOW FAST A TRAIN TRAVELS, IT MUST BE STOPPED
DIAMOND-S BRAKE SHOE
for all freight and passenger equipment.
SAMPSON DRIVER SHOE
for steam, electric and diesel locomotives.
Brake Shoes must be held firmly in place.
LOCKEY
should be used on all freight cars.
AMERICAN
Brake Shoe
COMPANY
BRAKE SHOE AND CASTINGS DIVISION


and ECONOMY...
PROTECT YOUR HIGH SPEED PASSENGER EQUIPMENT
AMERICAN BRAKE SHOE CONTROLLER
gives the shortest stops possible with no damage to wheels.
230 PARK AVENUE, NEW YORK 17, N. Y.
3844

A Smooth Ride



Springs are protected.
Spring Plates are eliminated.
Maintenance cost is low.



Section Thru Control Unit
Two Control Units in each frame

Full protection of cars and lading, rails and road-bed, is essential for economical railroad operation.

A smooth riding car relieves the car and contents from damaging vibrations and shocks, reduces wear on track and car structure, and greatly lengthens the life of equipment.

The National B-1 Truck is equipped with four built-in friction units which control both vertical and horizontal oscillations. No separate snubbers are necessary.

The frictional snubbing action is governed by the load carried, thus assuring a smoother riding car whether light or loaded.

Specify National B-1 Trucks with Dual Control

They meet all A.A.R. requirements

NATIONAL MALLEABLE AND

Sales Offices: New York, Philadelphia, Chicago, St. Louis, San Francisco
In Canada: Railway & Power Engineering Corp., Ltd., Toronto, Montreal

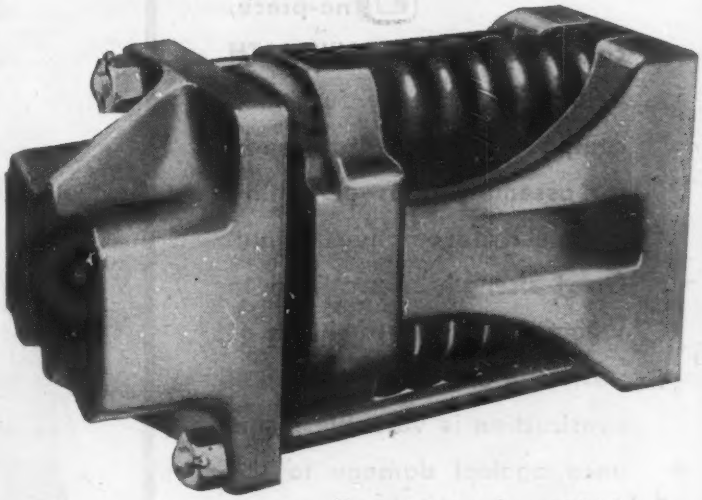
Light or Loaded

Millions of dollars are paid out each year for damage claims, of which a large percentage is due to inadequate draft gear protection.

National Friction Draft Gears were designed to afford maximum protection to cars and lading, by absorbing the shocks and blows incident to train operation.

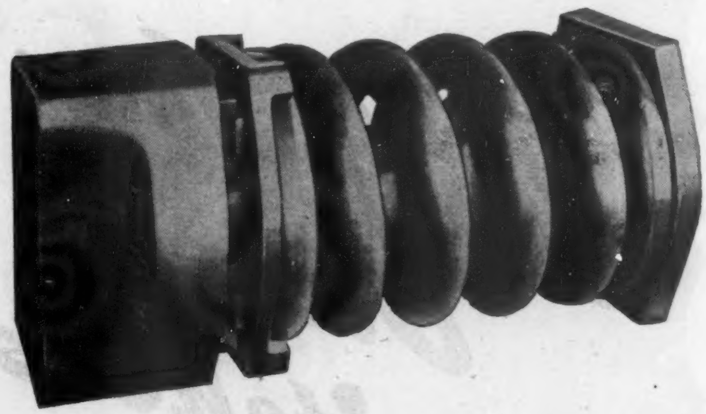
Smooth starting action coupled with high ultimate capacity allows these gears to absorb gradually the heaviest blows with the least shock to equipment.

This more efficient protection of cars and lading not only reduces damage claims, but also shows a noticeable reduction in car maintenance.



Type M-17-A—22⅜″ long

Draft Gears A.A.R. Approved



Type M-50-B—20⅛″ long

76 Years Service to Transportation

Specify NATIONAL Draft Gears for efficient, economical service.

STEEL CASTINGS COMPANY

Works: Cleveland, Chicago, Indianapolis, Sharon, Pa., Melrose Park, Ill.
General Offices: Cleveland, Ohio

builds of STAINLESS STEEL
for strength and safety

Public transportation at modern speeds demands precautions which must begin with the design and construction of cars in which passengers are carried.

Budd construction far exceeds A. A. R. and R. M. S. specifications for safety.

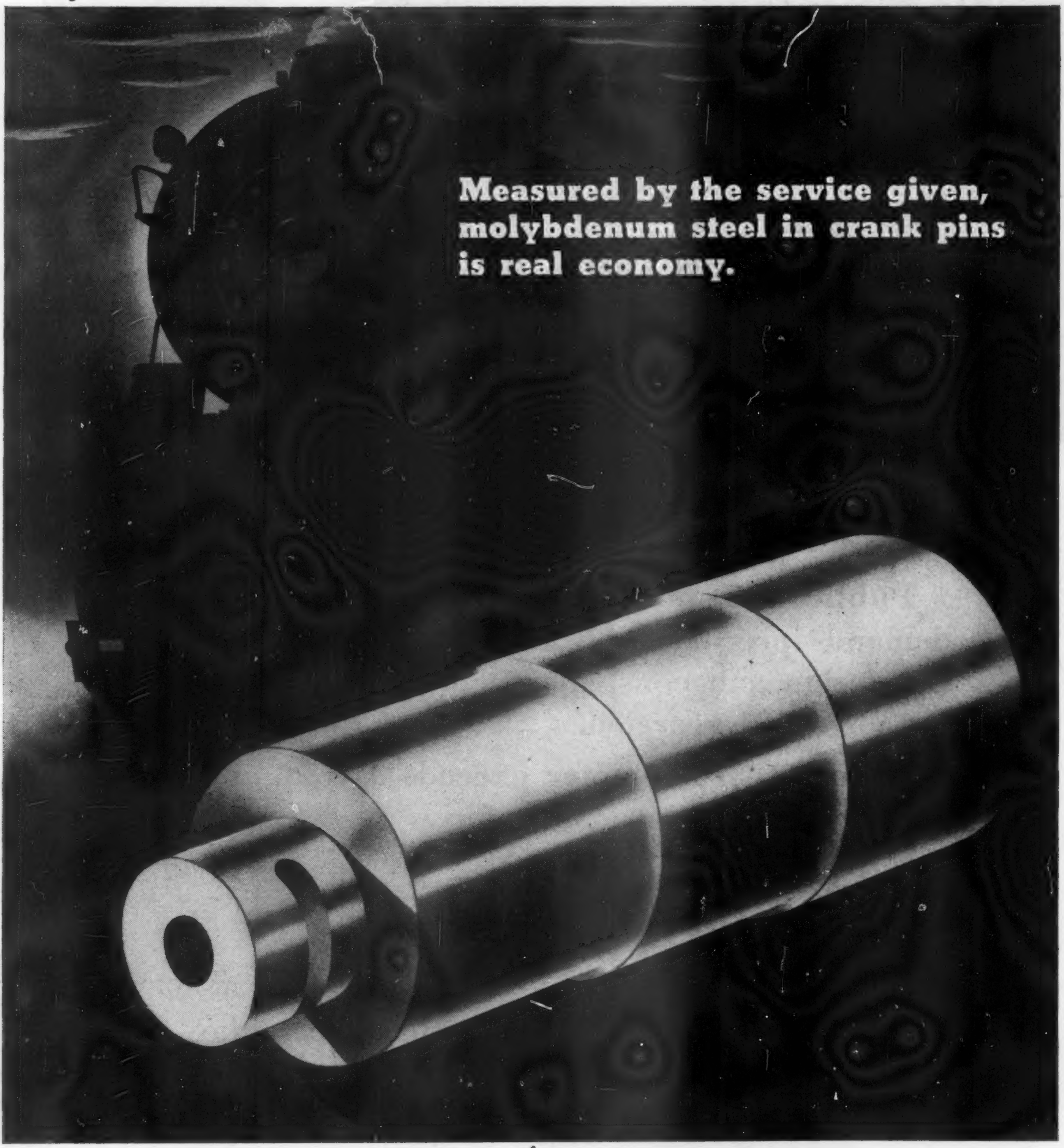
- **By superiority of material—**
- **By engineering design—**
- **By the SHOTWELD* system of fabrication—**

—Budd-built equipment more than meets the high responsibility assumed by the railroads as public carriers.

*Reg. U. S. Pat. Office

EDWARD G. BUDD MANUFACTURING CO.

PHILADELPHIA • DETROIT • NEW YORK • CHICAGO • ST. LOUIS • WASHINGTON • SAN FRANCISCO


Measured by the service given, molybdenum steel in crank pins is real economy.

8 ALCO-G.E. DIESEL-ELECTRICS

Tankers—200 to 300 a day—are classified and transferred by the B&O's eight Alco-G.E. diesel-electrics on Staten Island. Oil traffic on this division has increased more than 100 per cent since the beginning of 1944, when the eight diesel-electrics released 17 steamers.

HOW *Alco-G.E. Diesel-Electrics*

"We can depend on our Alco-G.E. diesel-electrics being ready for work whenever they're needed," says J. J. Sell, Superintendent of the B&O's Staten Island Division. "This avoids delays and enables us to meet the precisely timed schedules set up for the rapid movement of—

"—hospital trains to junctions in New Jersey where other railroads are waiting to speed the wounded veterans to inland hospitals. We save time by coupling the diesel-electric to the train—

Alco

AMERICAN LOCOMOTIVE

RELEASE 17 STEAMERS ABSORB 33% MORE TRAFFIC

WHILE ton-miles through the B&O's Staten Island terminals at St. George and Arlington climbed from 3,315,718 in July, 1943, to 4,418,867 in July, 1944, the motive power required took a decided drop—from 17 steam locomotives to eight Alco-G.E. diesel-electrics.

In addition, the diesel-electrics have an assignment that didn't exist two years ago: switching, classifying, and transferring as many as 120 passenger trains a month, most of which are important military movements.

Both jobs are being handled easily because, in these Alco-G.E. units, the inherent high availability of diesel-electrics has been further increased by low maintenance requirements. The only out-of-service time has been eight hours a month for I.C.C. inspection, resulting in an average availability of 98.7 per cent. That's why the B&O has been able to utilize them 87.3 per cent of the time and still have extra locomotive-hours available for emergency work.

This B&O operation is typical of how Alco-G.E. diesel-electrics are helping many railroads handle their heavily increased wartime traffic and, at the same time, make the necessary preparations for peacetime cost competition. How these locomotives can help you do both can be determined by a motive power survey on which our engineers will be glad to work with your own. Our recommendations will be impartial, because we build all three types of motive power—diesel-electric, electric, and steam.

INSURE THE PRECISE AND GENTLE MOVEMENT OF "TRAINS IN WHITE"

"—during loading operations. Their precise electric control makes coupling so gentle that even the most serious cases are not disturbed.

"And when the train pulls out, there's a gradual application of power—slack is taken up so smoothly that a drop of water wouldn't be spilled from a thimbleful on the rear platform of the last car."

118-115-9080

BUY WAR BONDS

and GENERAL ELECTRIC

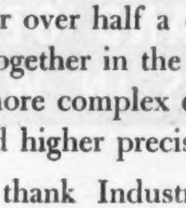
SHOULDER TO SHOULDER
for fifty-three years

Shoulder to shoulder for over half a century, American Industry and Hyatt have worked together in the field of mechanical progress—solving ever and ever more complex engineering design problems and arriving at higher and higher precision and performance.

Today, we want to thank Industry for its generous understanding of Hyatt's wartime obligation of first serving our country. Also, we want to assure Industry that there will be compensations—for the Hyatt Roller Bearings of peacetime will reflect valuable lessons learned in the making of super-precision and super-serviceable Hyatt Roller Bearings for the tools and weapons of war.

So shoulder to shoulder, American Industry and Hyatt will continue to new heights of accomplishment. Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey; Chicago; Detroit; Pittsburgh; Oakland, California.

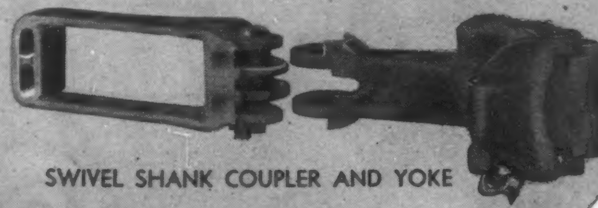
DIVISION OF

HYATT BEARINGS  **GENERAL MOTORS**

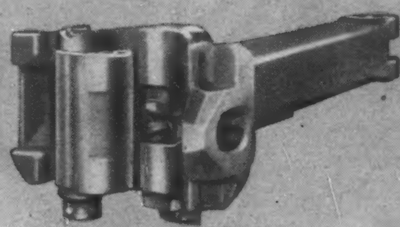
BUCKEYE

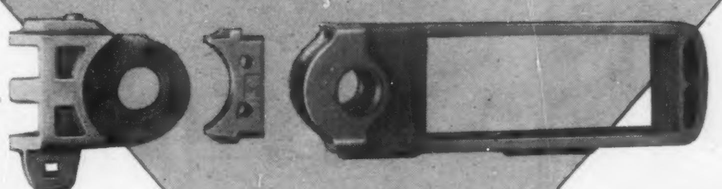
SPECIALISTS IN RAILWAY EQUIPMENT CASTINGS

RIGID SHANK COUPLER AND YOKE

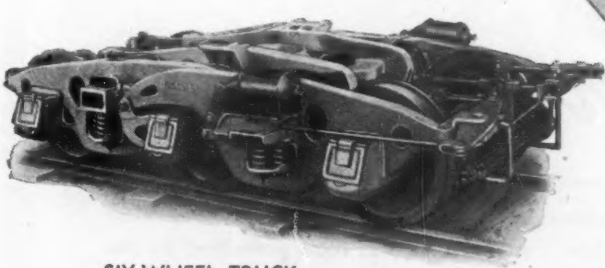


SWIVEL SHANK COUPLER AND YOKE

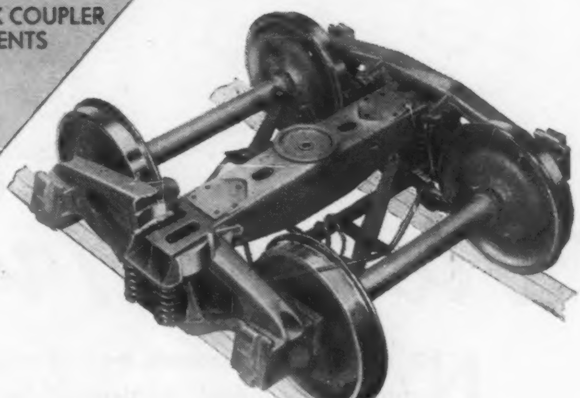




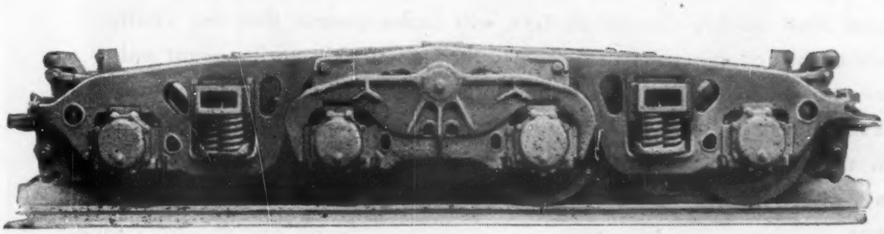
TYPE "H" TIGHTLOCK COUPLER AND ATTACHMENTS



SIX-WHEEL TRUCK



FOUR-WHEEL TRUCK

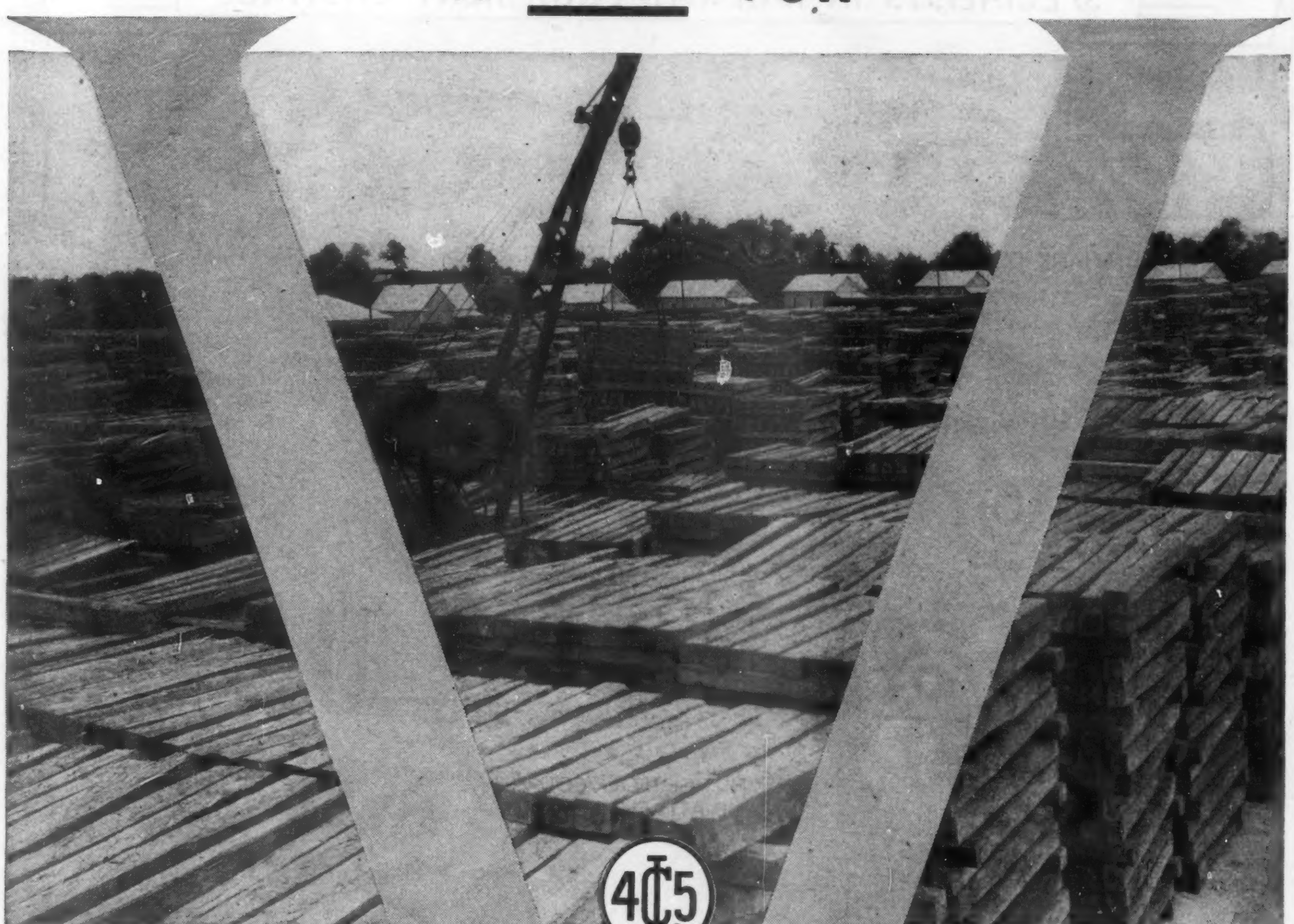


EIGHT-WHEEL TRUCK

THE BUCKEYE STEEL CASTINGS COMPANY

New York, N. Y. Columbus, Ohio Chicago, Ill.

ADEQUATE TRACK MAINTENANCE
A *MUST* FOR



4IC5 The International Dating Brand

Victory Transportation

NO matter how adequate the motive power and rolling stock of the railways, and no matter how urgent the demand for transportation, it is axiomatic that railway train service can be no safer, or more dependable, no faster or more regular than permitted by the track structure. Victory Transportation demands the best, and only the best.

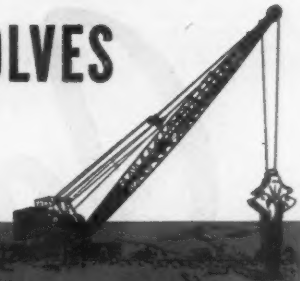
The use of International high quality Creosoted Ties will make certain that the vitally essential elements of track construction will retain their soundness and integrity — not only for the present emergency — but for many years thereafter. International Ties are an investment of the highest standard. Every tie is full size and is graded and marked permanently in strict accordance with A.R.E.A. specifications. The entire production and seasoning is supervised carefully to prevent decay, and treatments are made under scientific control using only the highest grade preservatives.

INTERNATIONAL CREOSOTING & CONSTRUCTION Co.

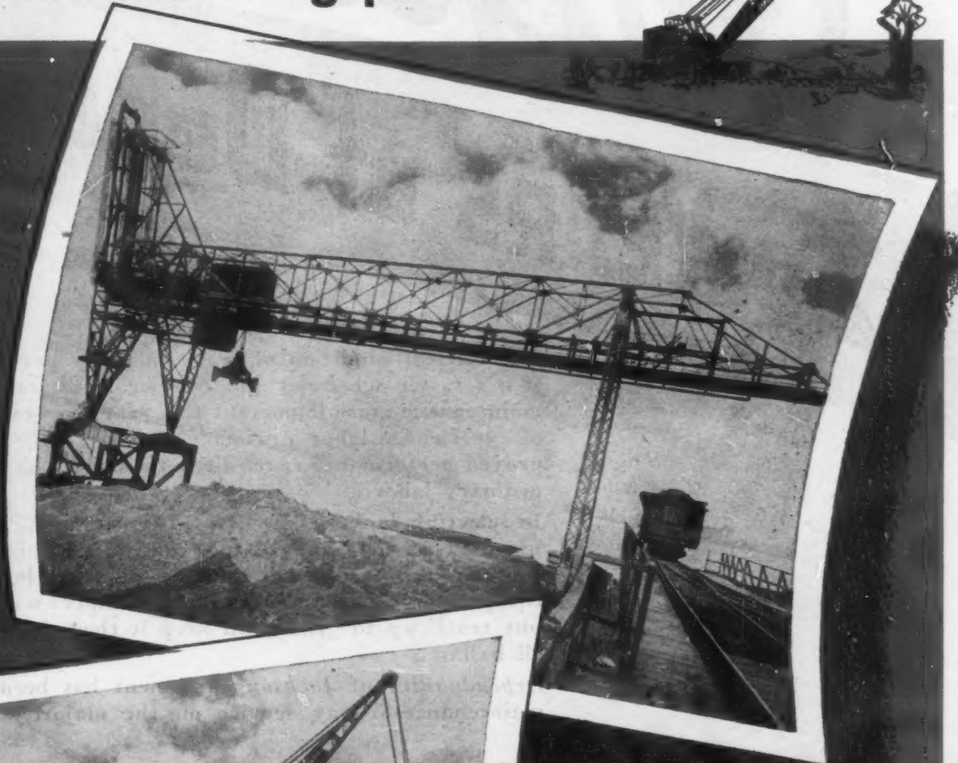
PRODUCERS OF HIGH GRADE TREATED TIES, POLES, PILES, ETC.

Galveston — Beaumont — Texarkana

Industrial Brownhoist Equipment SOLVES many a material handling problem



A large midwest steel company had a material handling problem of unloading and loading a big tonnage of iron ore from boat to storage to transfer car. An I.B. 15 ton Traveling Bridge Crane (right) easily solved the problem by handling from 800 to 1000 tons per hour. I.B. cranes are speeding the handling of ore, coal, aggregates, scrap iron and other materials in America's busiest ports and plants.



A large automobile manufacturer needed a portal pier crane at their dock for loading and unloading boats and freight cars. An especially designed I.B. four-motor electric crane handling up to 50,000 lbs. at one time (left) proved to be the answer.

Write for information about I.B. locomotive cranes and other materials handling equipment.

INDUSTRIAL BROWNHOIST CORP. • BAY CITY, MICH. • DISTRICT OFFICES: New York, Philadelphia, Cleveland, Chicago • Agencies: Detroit, Birmingham, Houston, Denver, Los Angeles, San Francisco, Seattle, Vancouver, B. C., Winnipeg, Canadian Brownhoist Ltd., Montreal, Quebec.

INDUSTRIAL BROWNHOIST BUILDS BETTER CRANES

Jackson

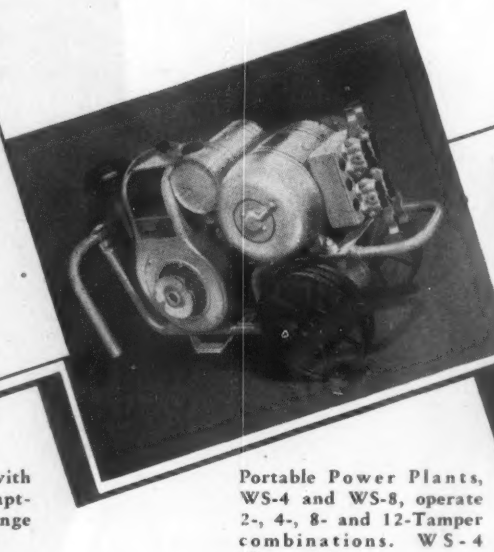
25 Years of Dependable

The critical condition of track in many parts of the Country, due to War's faster schedules and heavier loads, makes track and structure maintenance more important this year than ever before. With shortage of experienced labor a primary concern, more mechanized equipment of proved performance is required for doing the job right and quick with ordinary labor.

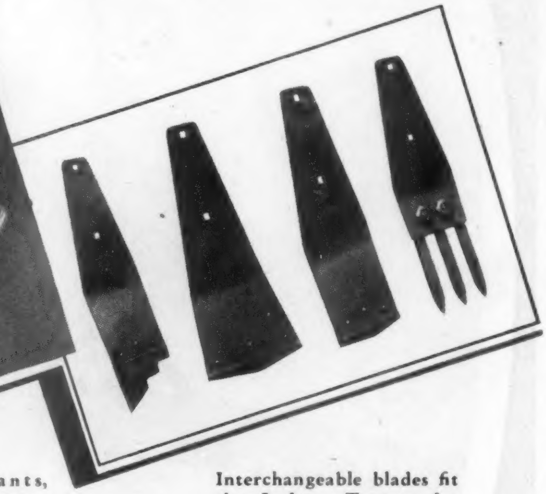
In selecting *Jackson Vibratory* Tampers and Portable Power Plants, for use as 2-, 4-, 8- and 12-tool outfits, you are assured of faster, more uniform and economical tamping than can be obtained with any other equipment. Jackson Methods and Tampers with Interchangeable Blades put track up to grade and keep it there longer, in any lift and with all ballasts.

Dependability of *Jackson* equipment has been proved in 25 years of maintenance-of-way service on the majority of American railroads.

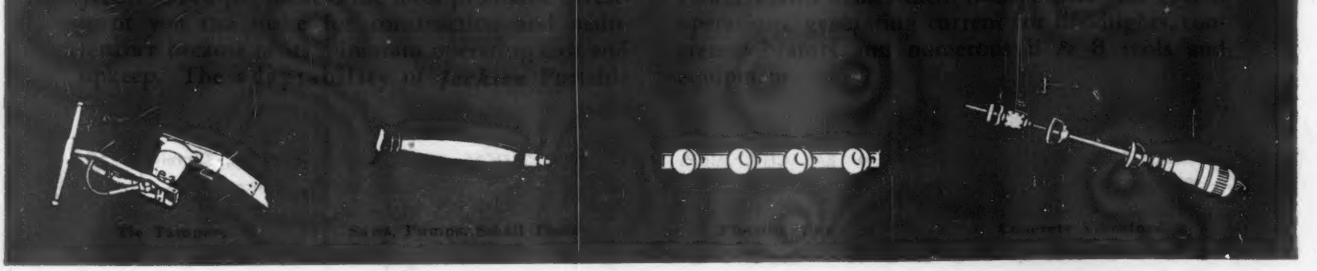
Jackson Tamper with Step-Cut Blade, adaptable to a wide range of use.



Portable Power Plants, WS-4 and WS-8, operate 2-, 4-, 8- and 12-Tamper combinations. WS-4 illustrated.



Interchangeable blades fit the Jackson Tamper for efficient operation in any lift and ballast.



Surfacing with JACKSON Tampers and Multiple Jack Method. Cross Tamping.

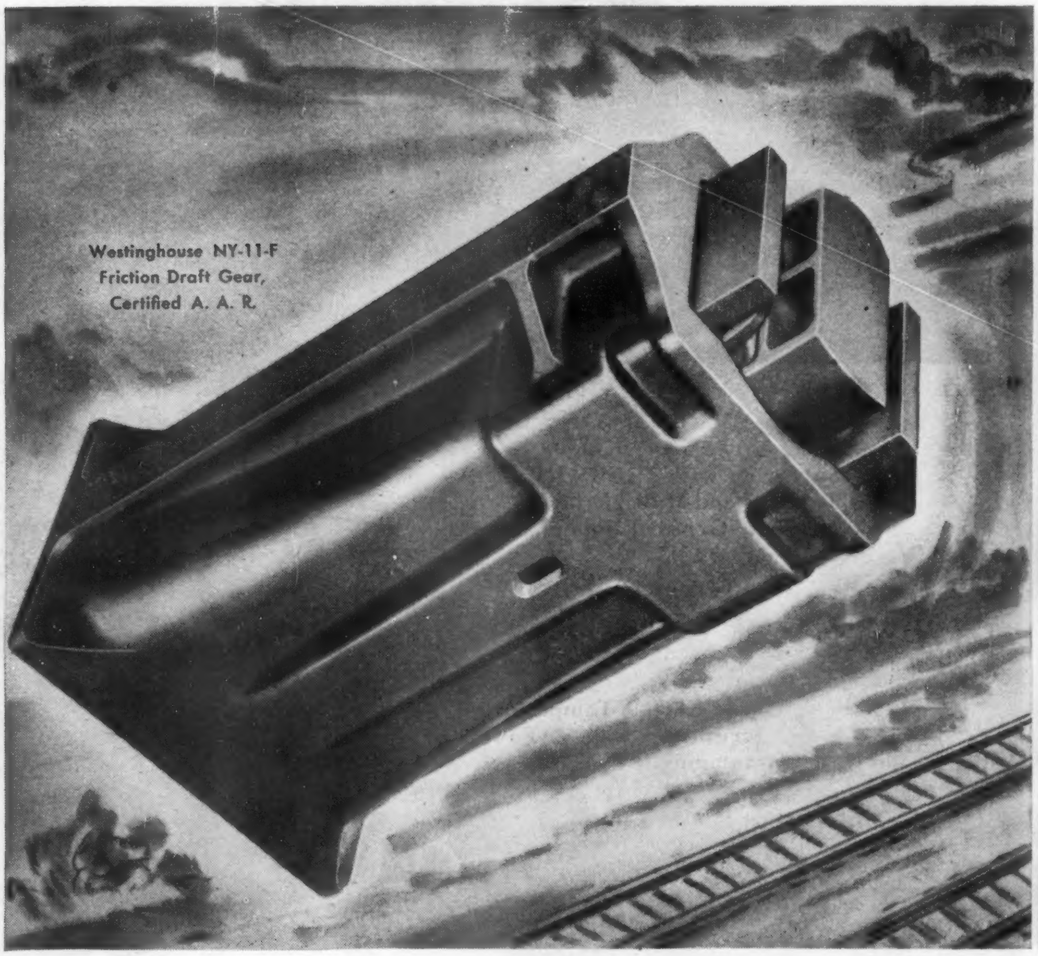
JACKSON Tampers in crushed rock. 8-Face tamping.

On this Silver Anniversary of the Electric Tamper & Equipment Co., we take pride in our contribution to the building and maintenance of sound track on the majority of American railroads, through the development of proficient tie tamping equipment and methods that assure speed with safety and economical operation. We pledge increased effort in the days of peaceful pursuit ahead to keep pace with the continued advancement of our great railroads.

O. Jackson
President

ELECTRIC TAMPER & EQUIPMENT CO., Ludington, Michigan

Protect your rolling stock investment



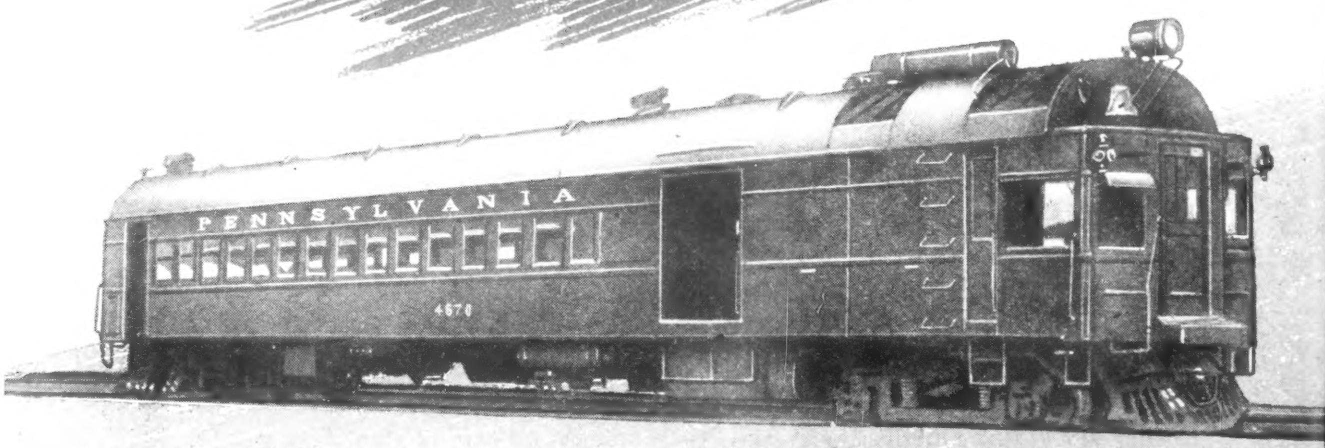
Westinghouse NY-11-F
Friction Draft Gear,
Certified A. A. R.

Cardwell M-25
Friction Draft Gear
Certified A. A. R.

Cardwell Friction
Bolster Spring
Type A

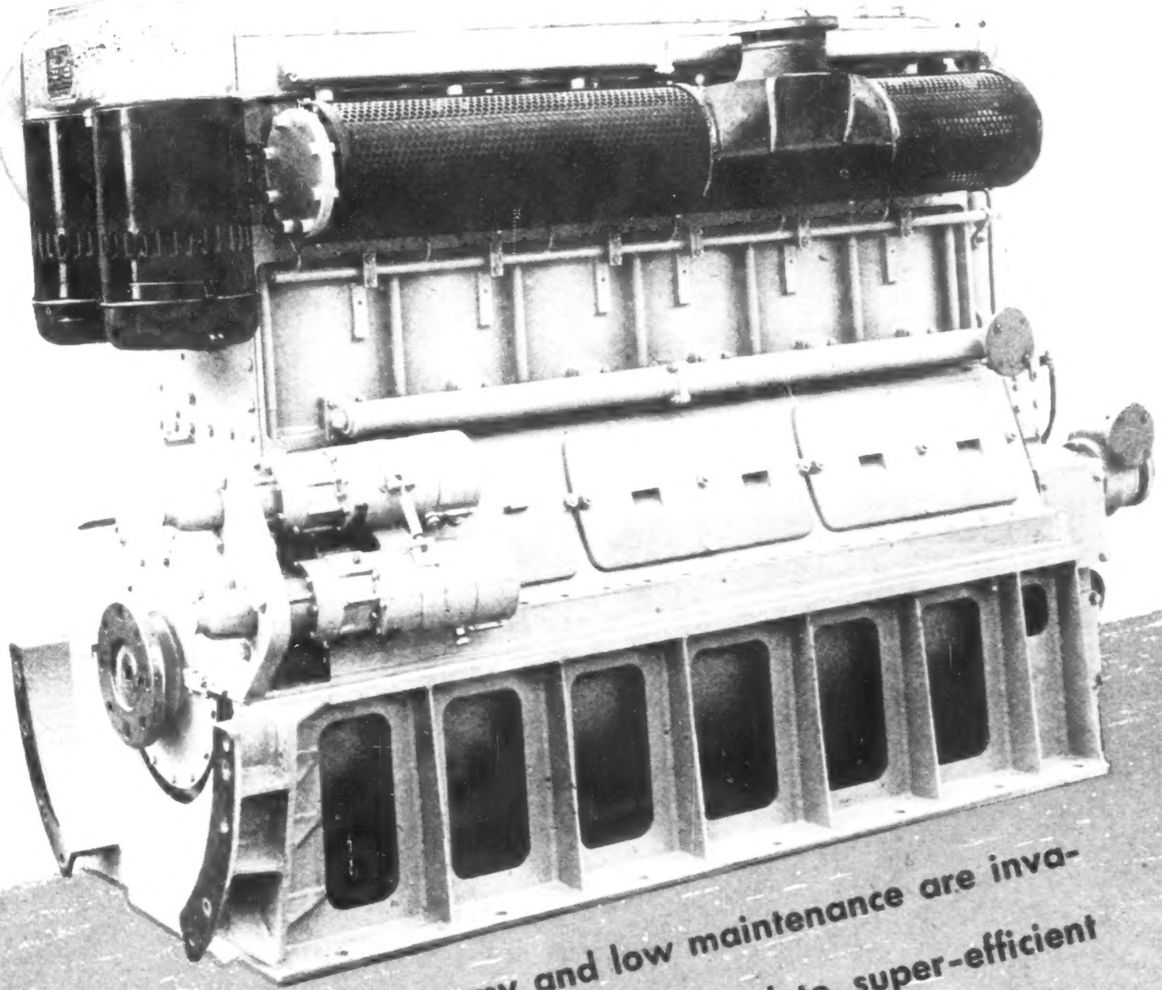
FOR EFFICIENT ECONOMICAL RAIL CAR OPERATION . . .

Convert to Hamilton DIESELS



Pennsylvania rail car powered by Hamilton Diesels, one of six installations.

Rock Island rail car with single installation. Four others have dual Hamilton Diesels.

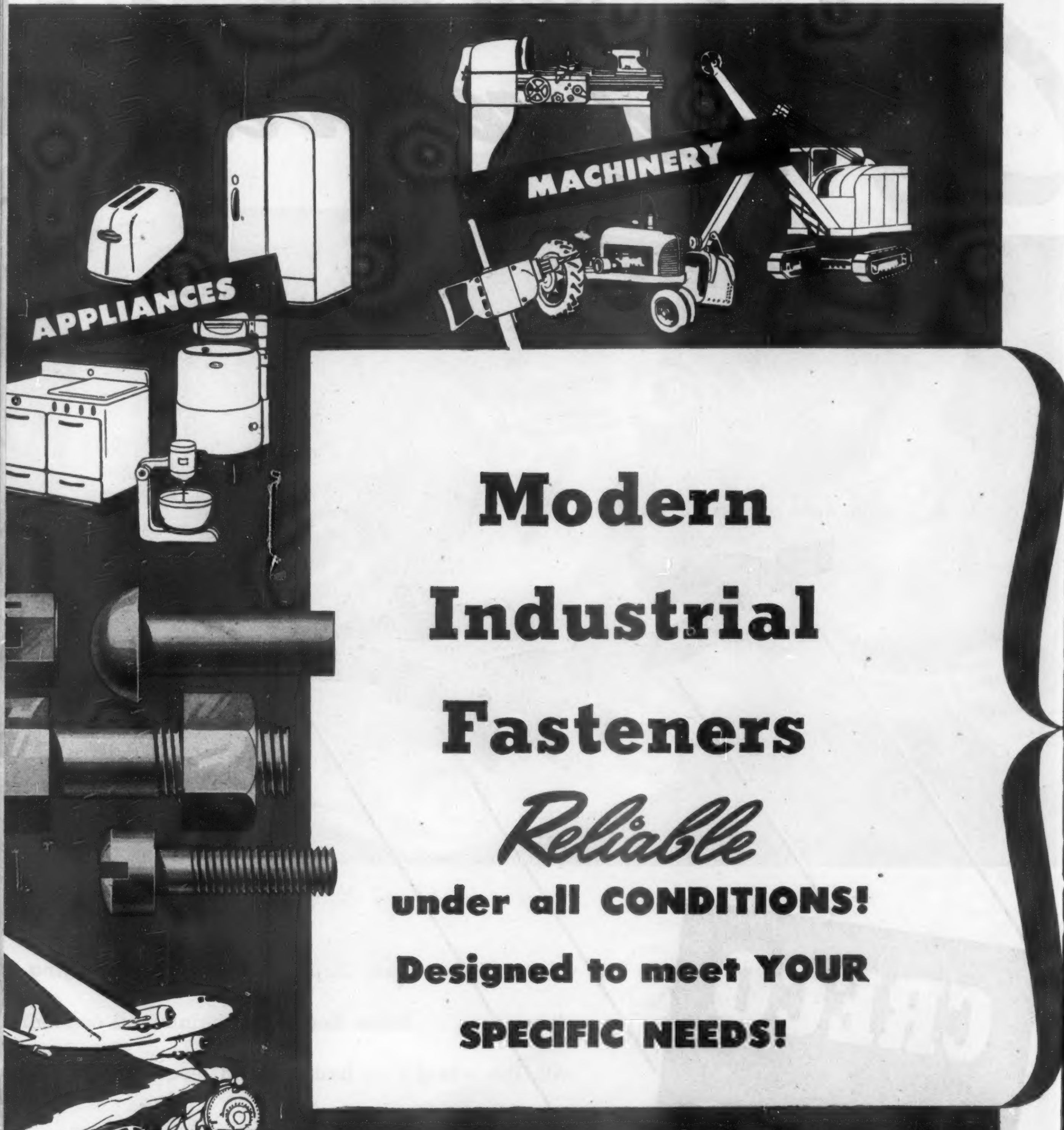


STREAMLINE GLASS FOR STREAMLINERS

Imperial Product Plate Glass

PRESSED PRISM PLATE GLASS CO.

General Office: Morgantown, West Virginia


MACHINERY
APPLIANCES
Modern
Industrial
Fasteners
Reliable
under all CONDITIONS!
Designed to meet YOUR
SPECIFIC NEEDS!
TRANSPORTATION
STRUCTURES

He was right, for years, when he said people talked about weather, but did nothing constructive about it. However, he's proved wrong today.

For our modern trains maintain delightful mountain-side temperatures, all the way across deserts. And our railway designers are working, successfully, now, to provide even finer, "*weather-proofed*" train-riding comfort and relaxation.

Significant, in their success, is the Dayton V-Belt Drive. For Dayton V-Belts deliver smooth-running, long-lived, trouble-free, power-transmission required for Modern Railway Equipment.

They are V-Belts engineered by Dayton's own Railway Division, and approved by Dayton's own precise technicians. They're strong, long-lasting, tough, hard-gripping; and far more weather and water resistant than any other V-Belts known.

Complete V-Belt engineering data is now available. It has been compiled during 40 years of Dayton's specialized experience in the processing of both natural and synthetic rubber. So consult with Dayton Rubber, your specialized manufacturer, on any present or future power-transmission problem . . . especially for air-conditioning, car-lighting, or Diesel locomotive operation. We will be glad to help you.

Dayton Two-inch "D-R" V-Belt Drive

THE DAYTON RUBBER MANUFACTURING CO.
DAYTON 1, OHIO

Pioneers of Railway V-Belts and Connectors—
The World's Largest Manufacturer of V-Belts

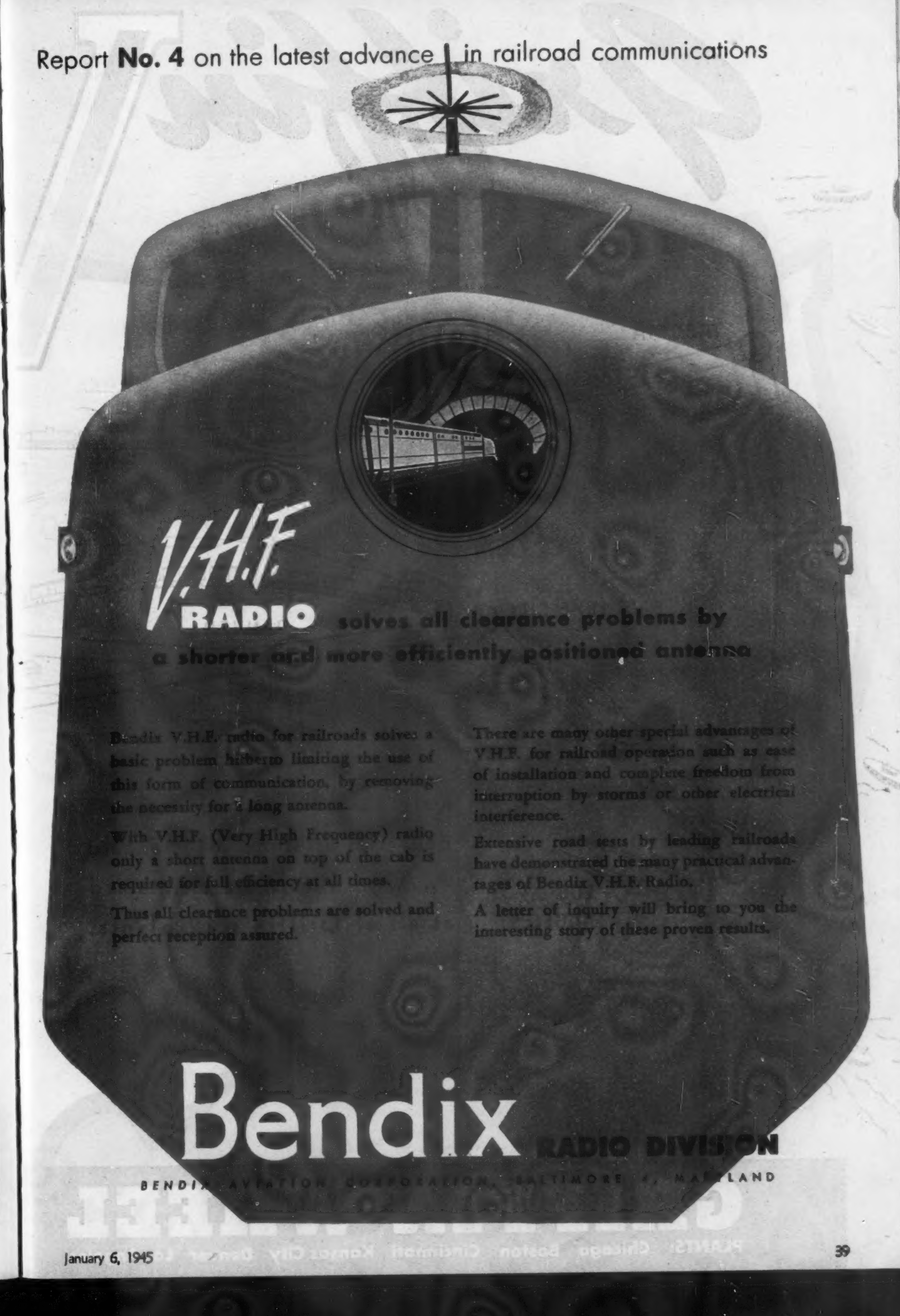
Specialized Manufacturer for the R. R. Industry

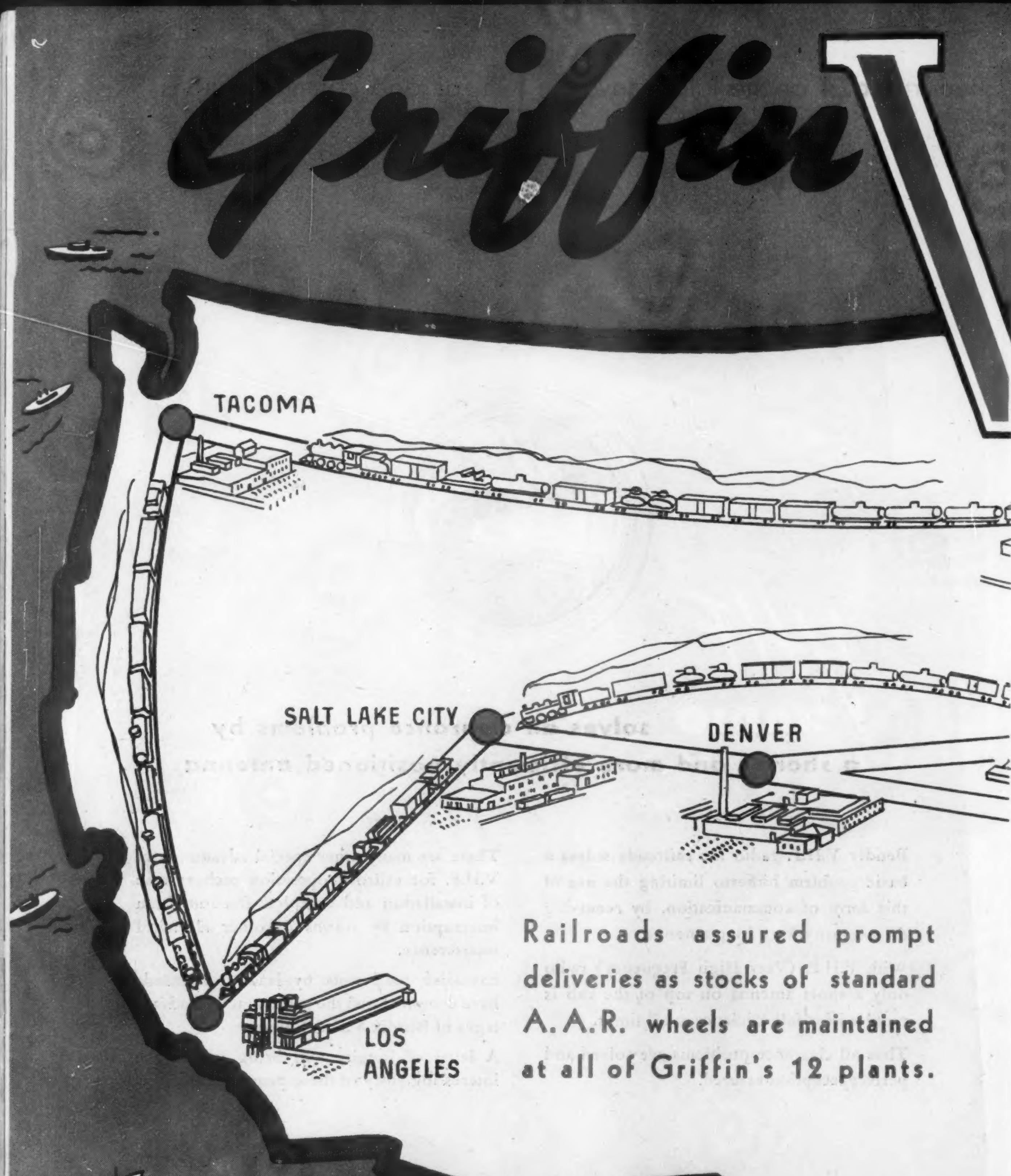
★ KEEP ON BUYING WAR BONDS ★

V-Belts by Dayton Rubber

The Mark of Technical Excellence in Synthetic Rubber


ARMY
E
NAVY


Report No. 4 on the latest advance in railroad communications
V.H.F. RADIO solves all clearance problems by a shorter and more efficiently positioned antenna
Bendix V.H.F. radio for railroads solves a basic problem hitherto limiting the use of this form of communication, by removing the necessity for a long antenna.
With V.H.F. (Very High Frequency) radio only a short antenna on top of the cab is required for full efficiency at all times.
Thus all clearance problems are solved and perfect reception assured.
There are many other special advantages of V.H.F. for railroad operation such as ease of installation and complete freedom from interruption by storms or other electrical interference.
Extensive road tests by leading railroads have demonstrated the many practical advantages of Bendix V.H.F. Radio.
A letter of inquiry will bring to you the interesting story of these proven results.
Bendix RADIO DIVISION
BENDIX AVIATION CORPORATION, BALTIMORE 4, MARYLAND


Griffin
TACOMA
SALT LAKE CITY
DENVER
LOS ANGELES
Railroads assured prompt deliveries as stocks of standard A.A.R. wheels are maintained at all of Griffin's 12 plants.
GRIFFIN WHEEL
PLANTS: Chicago Boston Cincinnati Kansas City Denver Los Angeles


Wheels
ST. PAUL
DETROIT
BOSTON
CHICAGO
CLEVELAND
COUNCIL BLUFFS
CINCINNATI
KANSAS CITY
GRIFFIN WHEEL CO.
A.A.R. STANDARD

Famous GRIPS

The Half-Nelson GRIP and Crotch Hold. It was with this combination that Frank Lewis won the World's Championship at the Olympic Games in 1936.

- The **Half-Nelson** as applied by the Champion couldn't be broken until he released his **GRIP**.
- **GRIP** Nuts, too, are famous for their unmatched ability to **GRIP** and hold, under the most severe conditions of vibration.
- Their **GRIP** can be broken only by a man with a wrench.

GRIP NUT COMPANY

310 SOUTH MICHIGAN AVENUE, CHICAGO 4, ILLINOIS

Serving American Railroads since 1906 REGIONAL OFFICES: ST. PAUL · MINNEAPOLIS · ST. LOUIS
SAN FRANCISCO · CHICAGO · CLEVELAND · SALT LAKE CITY · SALISBURY, N. C. · PITTSBURGH · NEW YORK


"PRESSED S
PRESSED S
HELP SPEED THE Beans and Bullets
TO OUR ARMED FORCES...
The efficient manner in which American railroads have handled the mammoth job of moving munitions and foodstuffs of war has astounded the entire world. The major role played by freight cars is quite evident. All materials and finished products for tanks, planes, guns, ships—foodstuffs, munitions, etc., are moved part way at least by rail.
Many thousands of Pressed Steel Cars of all types have helped the railroads break all traffic records and with a minimum of new equipment. Their durability, ruggedness and high quality have kept them off the rip track, and instead these super performers are delivering maximum service for longer periods of time with minimum maintenance. It is this kind of dependable service that keeps things moving on the home front and to our own armies and our fighting allies all over the world.
LEHIGH VALLEY
The Army Eats by the Trainload
LEHIGH VALLEY RAILROAD
CHICAGO
Going to Town in..
PRESSED STEEL CARS
COAL "Goes to Town"
Thousands of New Jersey Central Cars Help Speed Vital War Shipments
PRESSED STEEL CAR COMPANY, INC.
NEW YORK · PITTSBURGH · CHICAGO
JERSEY CENTRAL LINES
PRESSED STEEL
HELP D
The Big Drive!
Rio Grande
PRESSED STEEL
PRESSED STEEL CAR
Appreciates This Tribute to the Car Building Industry
3600 ROCK ISLAND box cars and thousands of other Pressed Steel Cars have helped the railroads to smash all time records with tip-top efficiency . . . Stamina, and plenty of it, has always been an outstanding characteristic of Pressed Steel Cars, dating back 45 years when this company began producing the first all-steel freight cars. In the course of the pioneering period and in subsequent years, Pressed Steel Car has originated designs and methods of construction that have been incorporated in the standardized designs of present-day cars. The company's advanced engineering always stressed the importance of improved car construction to provide greater strength, durability and safety for greater speeds, economy and better transportation.
STAMINA
ROCKETS
ISLAND LINES
YORK—PITTSBURGH—CHICAGO
D & R
21000

why OKOPRENE protection

Railroad men have found that Okoprene protected cables resist the moisture, oil, chemical, heat, sunlight, flame and weather conditions that hasten the destruction of rubber-insulated wires with fibrous coverings. They have therefore specified electrical wires clad with Okoprene for every type of railroad service, and found the results good.

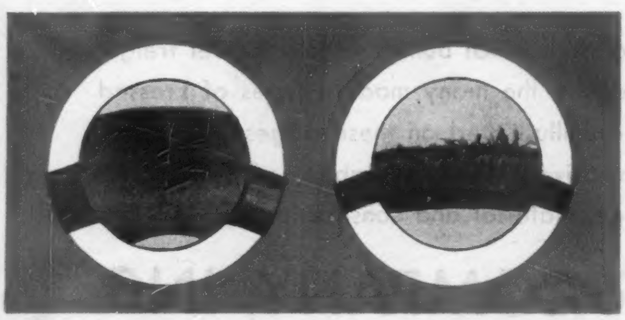
WHAT IS OKOPRENE?

Okoprene, compounded with neoprene, is an exceptionally durable covering for cables developed in the Okonite Research Laboratories. It can be bonded to the rubber insulation of individual wires or can be applied as a sheath or jacket over the core of multiple conductor cables. It can be used to protect practically any type or design of cable.

Since 1931, proving ground tests and field experience with millions of feet of wire have been proving the stability and long life of Okoprene coverings under widely varied conditions.

WEATHER RESISTANCE

(Aerial cables, C.T.C. wire, exposed wiring) **Okoprene sheaths will not rot or deteriorate when subjected to moisture or even when buried directly in the ground as compared with braided, jute or other fibrous-covered cables. There are no saturating compounds to erode or flake off.**

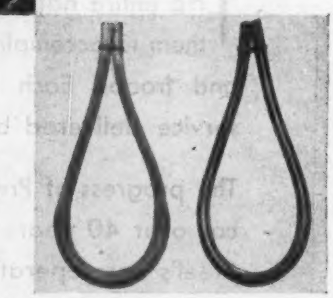


Relative deterioration after six years exposure. *Left:* Okoprene sheath smooth and unchanged by elements. *Right:* Saturated braid with compound eroded and braid destroyed.

CHEMICAL RESISTANCE

(Cables buried in cinders or exposed to smoke or chemicals) **The Okoprene jacket has excellent resistance to most acids, alkalies and other corrosive chemicals which destroy braids, lead and other cable coverings. Tests show it is not affected by acids or alkalies encountered in the ground. It is particularly good in resistance to sulphur acids, such as are present in soft coal smoke and cinders.**

• In sulphuric acid battery electrolyte of specific gravity 1.300 at a temperature of 160° F., the Okoprene jacket was in good condition after 21 months immersion.



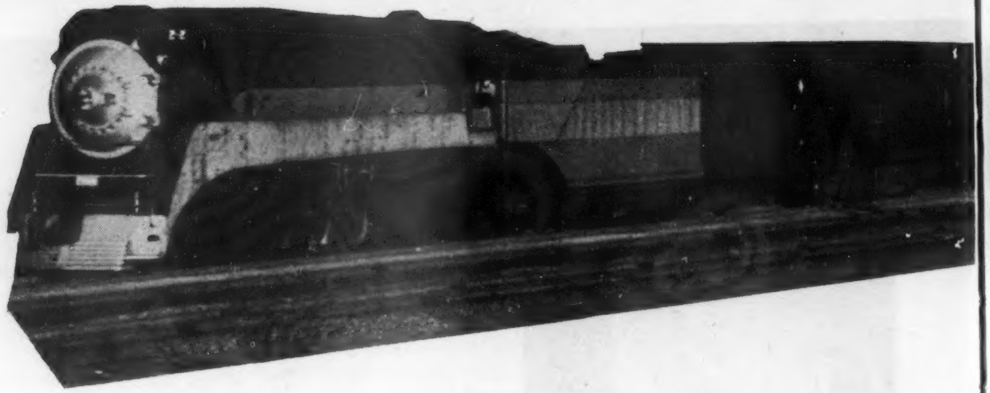
• After 7 days immersion in benzine, rubber sheaths became soft, increased 51.7% in diameter (left), while Okoprene jacket stayed in excellent condition and increased only 22.1% in diameter.

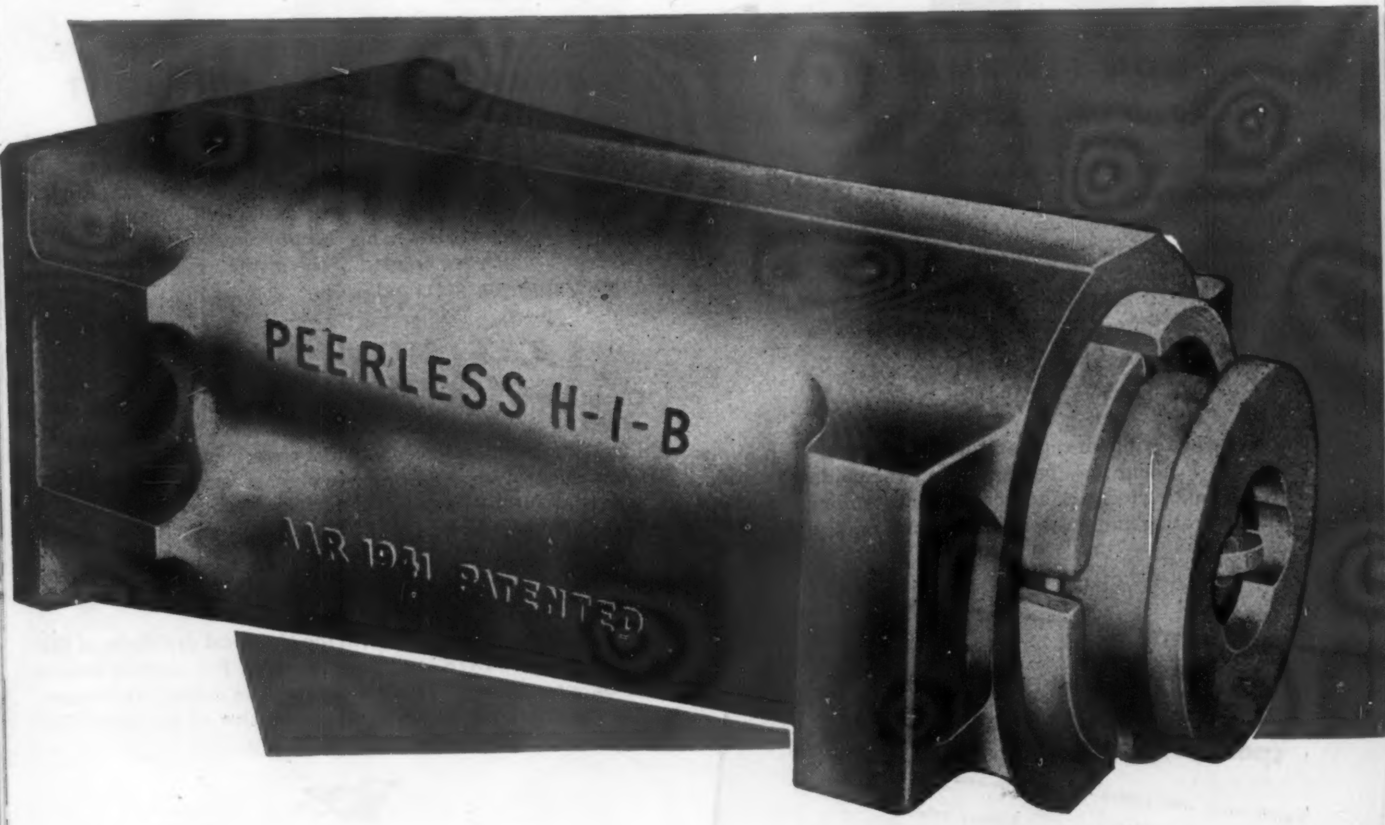
OIL RESISTANCE

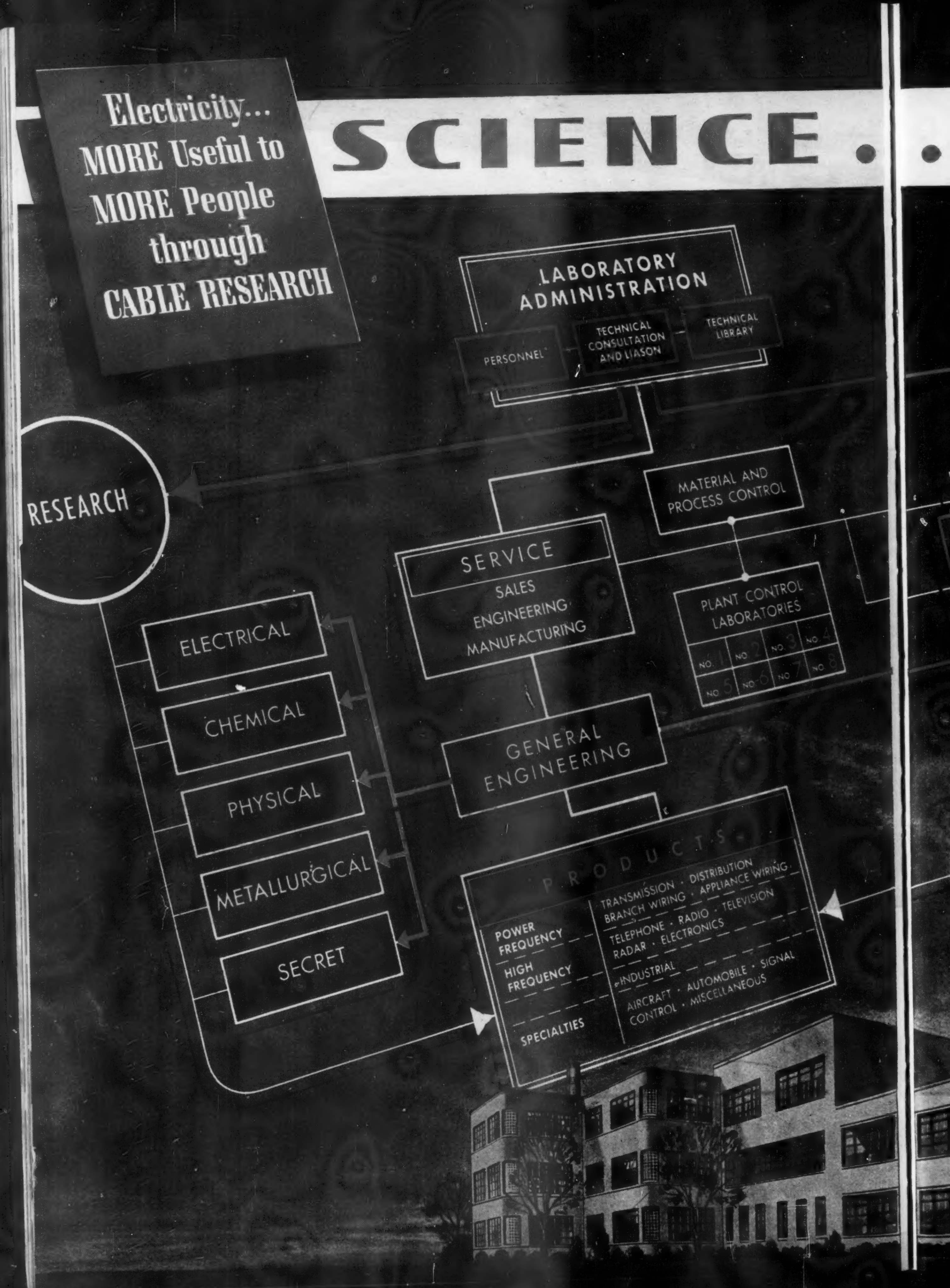
(Portable cords, car and roundhouse wiring, etc.) **When exposed to the solvent action of petroleum products, Okoprene coverings protect the wire insulation from swelling and softening. Okoprene sheaths retain their full mechanical strength after such exposure.**

Okocord Portable Cords with Okoprene tough, wear-resistant sheath.

C.T.C. aerial cable. Each insulated conductor sealed within a bonded Okoprene sheath.




PEERLESS H-I-B
AAR 1941 PATENTED


Electricity... MORE Useful to MORE People through CABLE RESEARCH
SCIENCE...
LABORATORY ADMINISTRATION
PERSONNEL
TECHNICAL CONSULTATION AND LIASON
TECHNICAL LIBRARY
RESEARCH
MATERIAL AND PROCESS CONTROL
SERVICE
SALES
ENGINEERING
MANUFACTURING
PLANT CONTROL LABORATORIES
NO. 1
NO. 2
NO. 3
NO. 4
NO. 5
NO. 6
NO. 7
NO. 8
ELECTRICAL
CHEMICAL
PHYSICAL
METALLURGICAL
SECRET
GENERAL ENGINEERING
PRODUCTS
POWER FREQUENCY
TRANSMISSION · DISTRIBUTION
BRANCH WIRING · APPLIANCE WIRING
HIGH FREQUENCY
TELEPHONE · RADIO · TELEVISION
RADAR · ELECTRONICS
SPECIALTIES
INDUSTRIAL
AIRCRAFT · AUTOMOBILE · SIGNAL
CONTROL · MISCELLANEOUS

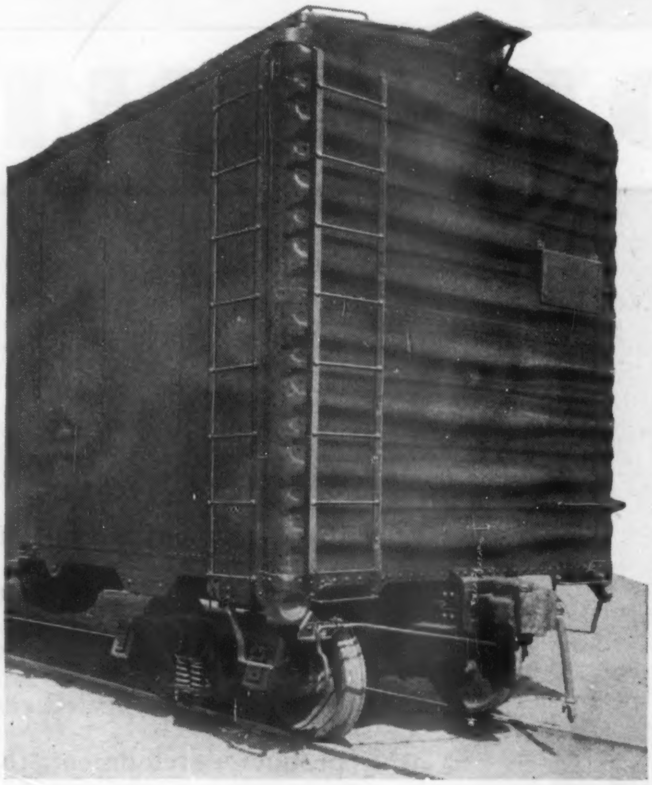
. . . . ORGANIZED

The General Cable Research Laboratory is by no means an end in itself. The great, new building, its facilities and scientific equipment are but an impressive and efficient tool in the hands of the men who are bringing into being this Company's far-visioned industrial program.

Here, pure and applied research go hand in hand with product development, to extend the use of electricity more usefully to more and more people. The achievements now in the making and the achievements of tomorrow will complement the substantial advances already "on the record", by virtue of which General Cable has won and maintained its position in the industry. Research is the spearhead of progress.

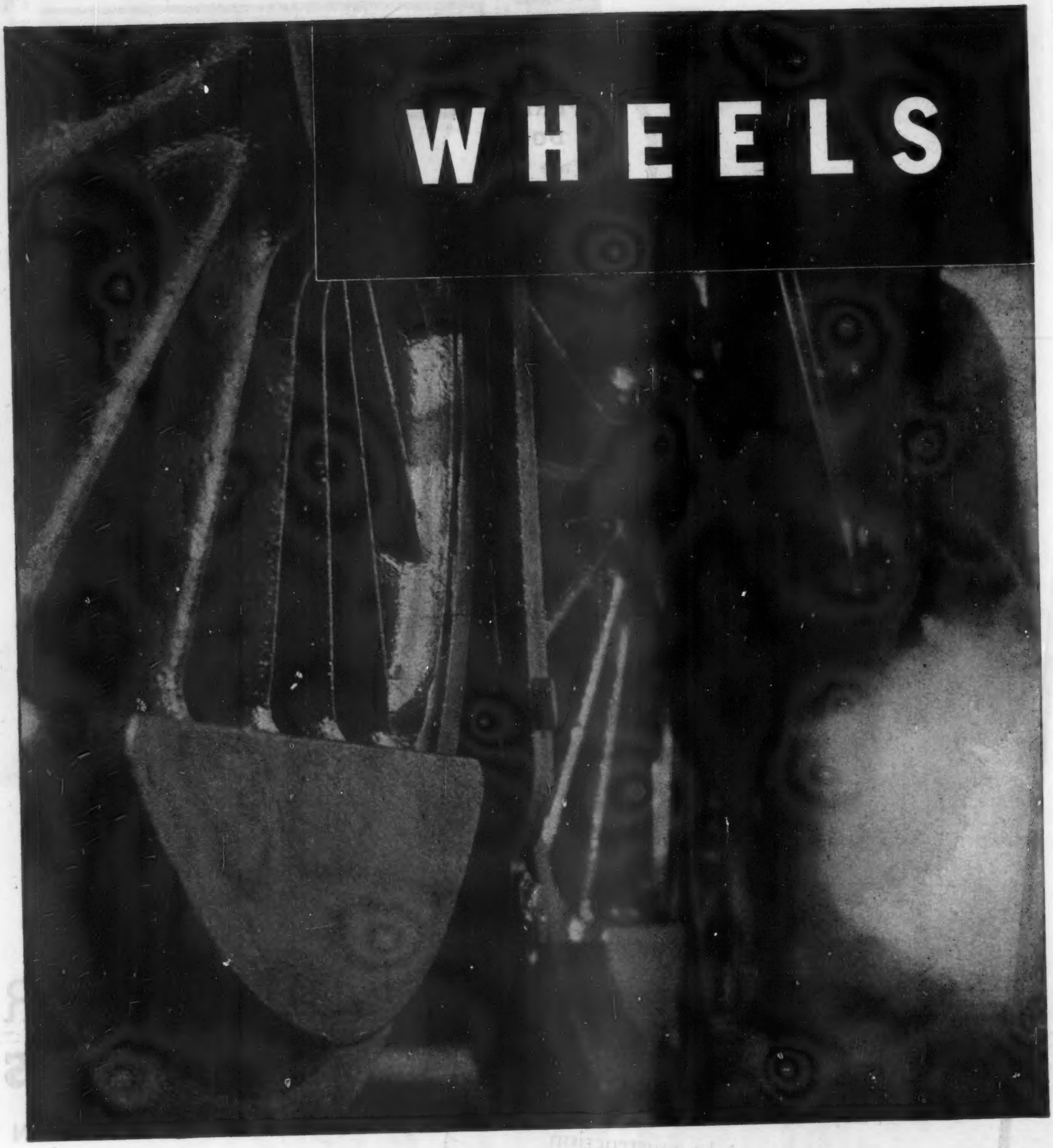
GENERAL CABLE CORPORATION

Manufacturers of Bare and Insulated Wires and Cables for Every Electrical Purpose




NEW YORK CENTRAL
PENNSYLVANIA

Phantom View of Magnus Car Journal Lubricator and Self-Cooling Oil-Tube Journal Bearing.


WHEELS

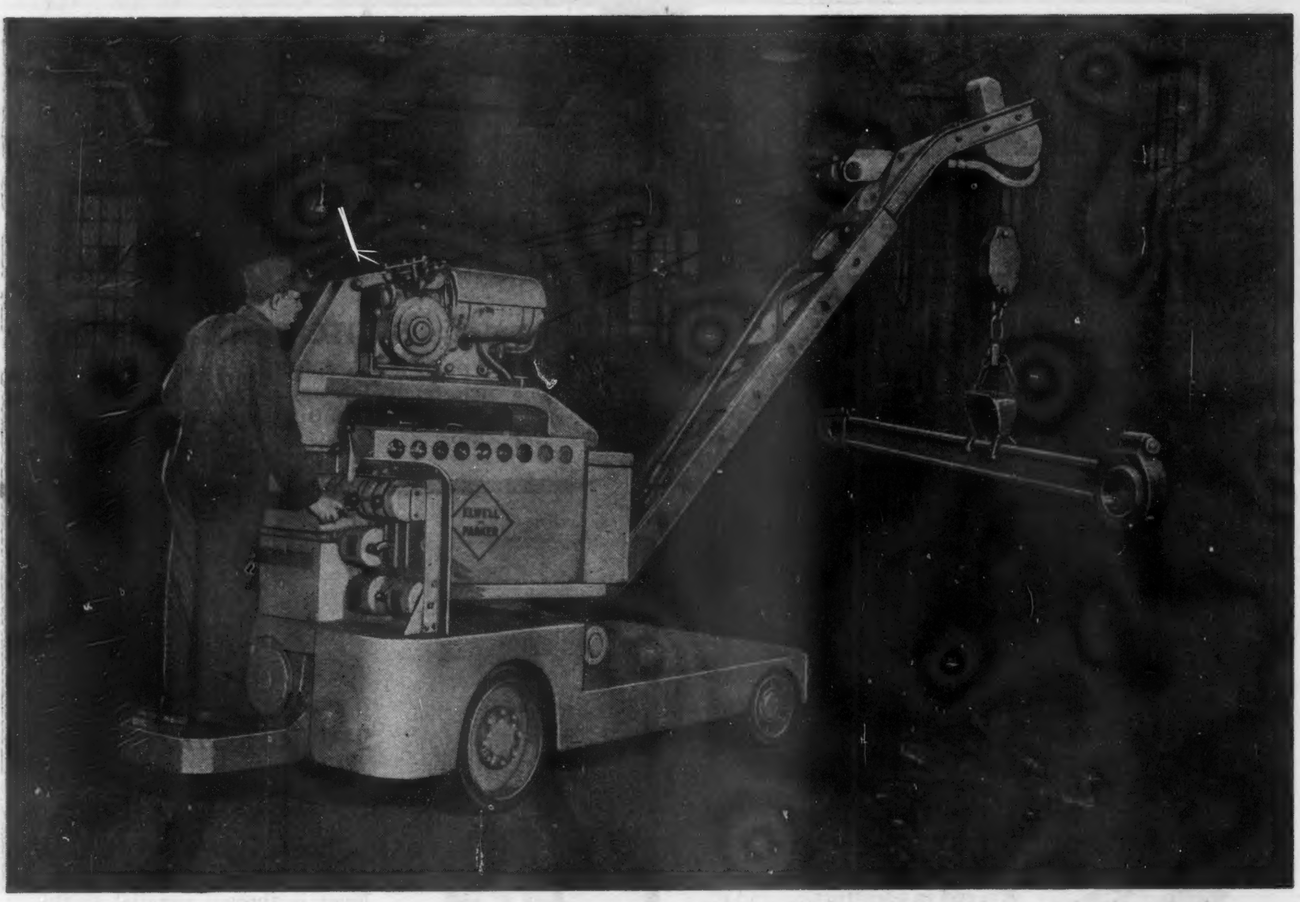
OF PROGRESS

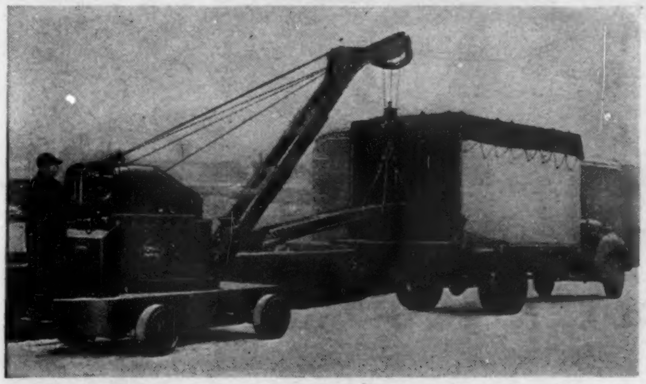
● American railroads, carrying an unprecedented burden through all the war years, have distinguished themselves in a manner which has won universal acclaim. The Midvale Company is glad to add its voice to this tribute.

Midvale is proud also of the part this Company has had in supplying durable equipment for railroad operation. As a pioneer maker of tires for driving wheels, Midvale began, more than three quarters of a century ago, to supply the railroads with steel in many forms. Today Midvale produces not only locomotive tires but built-up car wheels and alloy steel forgings for a multitude of uses both on the road and in the railroad shops. Midvale has contributed likewise to the equipment of many essential industries as well as producing ordnance in large quantities for the United States Navy and Army.

COMPANY NICETOWN PHILADELPHIA

WASHINGTON · · · CLEVELAND · · · SAN FRANCISCO





Big savings still ahead in handling *your* Terminal, Shop, Stores Loads

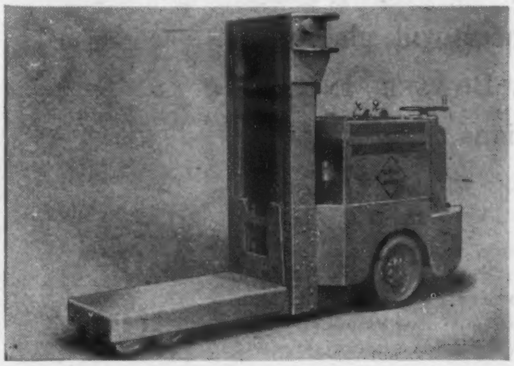
The E-P Man's experience book is packed with sound methods for handling all Railway materials faster—more safely—more economically.

A properly organized Load-Handling System is your own "internal railway." Elwell-Parker has the experience—the facilities—the equipment—to move all of your parts, materials and supplies without waste. You still need the savings that Elwell-Parkers can earn for you.

Your friend—the E-P Load-Transportation Advisor in your Main Line City—understands Project Location—Runway Construction—Ramps—Bridges—Tunnels—Freight Handling and Scheduling. Here is his telephone address. Better get in touch with him today.

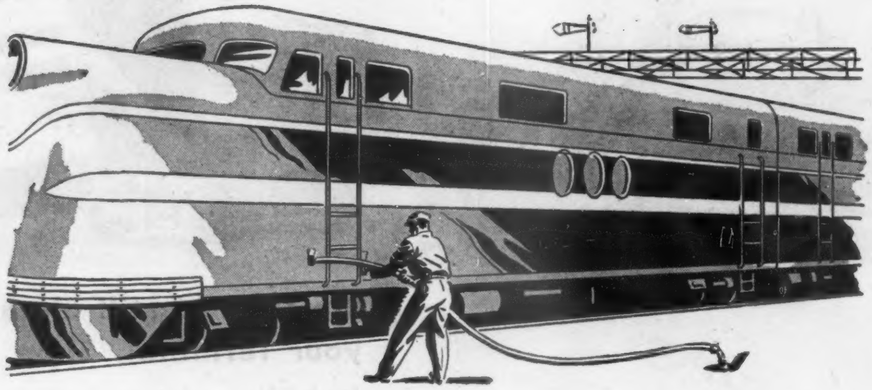
DIAL THE E-P MAN TODAY!

Albany	2-4095	Greenville	534
Birmingham	3-3323	Indianapolis	LI 3131
Boston	COM 5522	Jacksonville	5-1384
Buffalo	GR 7664	Kansas City	VA 7021
Charlotte	5026	Los Angeles	PR 5911
Chicago	SUP 7420	Memphis	8-1648
Cincinnati	MA 0650	Milwaukee	MA 7817
Cleveland	MA 8915	Minneapolis	GE 3247
Columbus	AD 4824	Montreal	HA 7191
Denver	KE 5500	New York	COR 7-0797
Detroit	MA 2233	New Orleans	MA 6316-C
Ft. Worth	4-6184	Philadelphia	LOM 3710
		Pittsburgh	AT 6734
		St. Louis	LA 4545
		San Antonio	TR 3653
		San Francisco	GA 1827
		Seattle	EL 5722
		Syracuse	2-9596
		Toronto	WA 1478



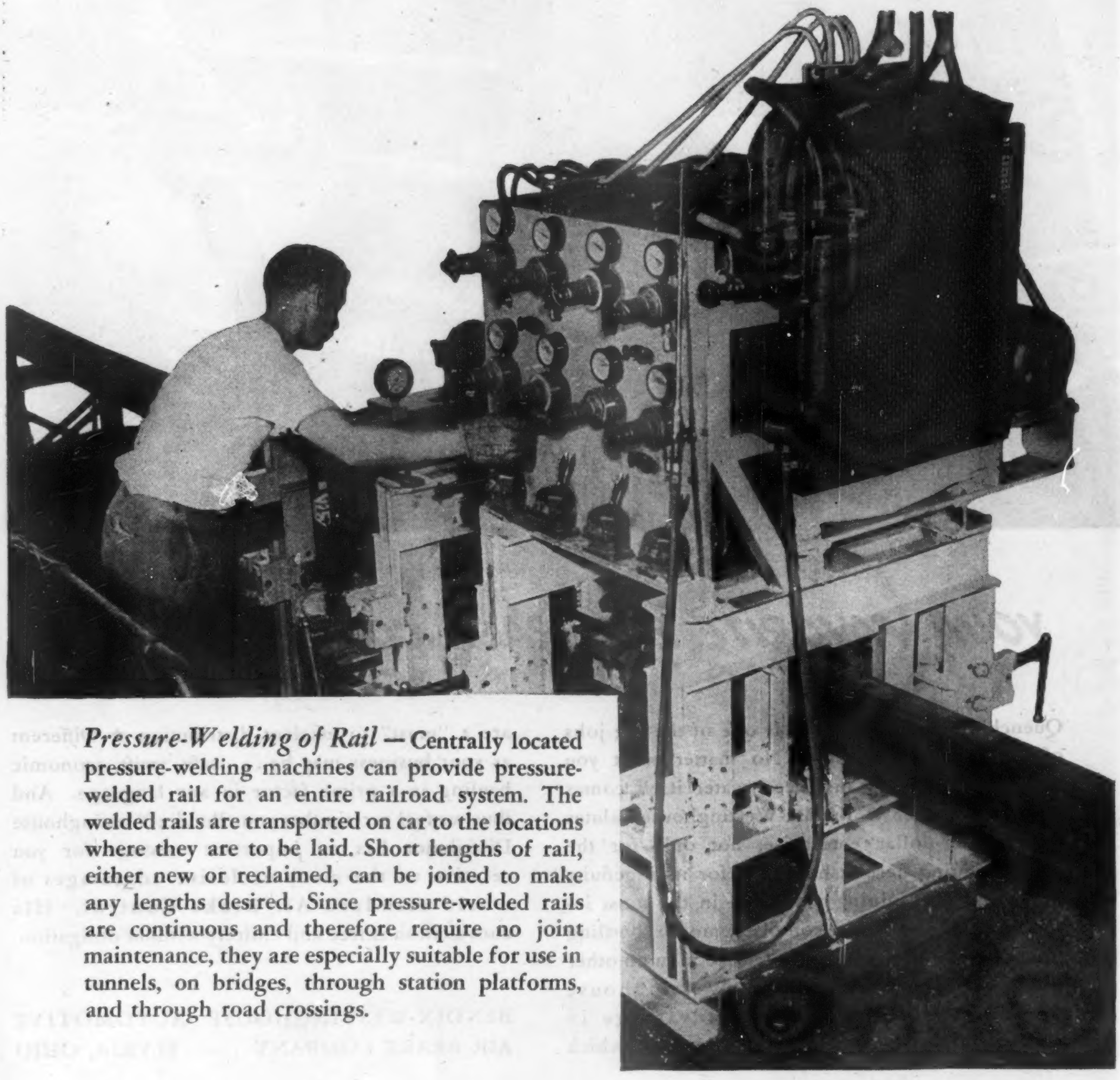
ELWELL-PARKER

POWER INDUSTRIAL TRUCKS



Oxweld Methods

Speed Maintenance



Pressure-Welding of Rail — Centrally located pressure-welding machines can provide pressure-welded rail for an entire railroad system. The welded rails are transported on car to the locations where they are to be laid. Short lengths of rail, either new or reclaimed, can be joined to make any lengths desired. Since pressure-welded rails are continuous and therefore require no joint maintenance, they are especially suitable for use in tunnels, on bridges, through station platforms, and through road crossings.

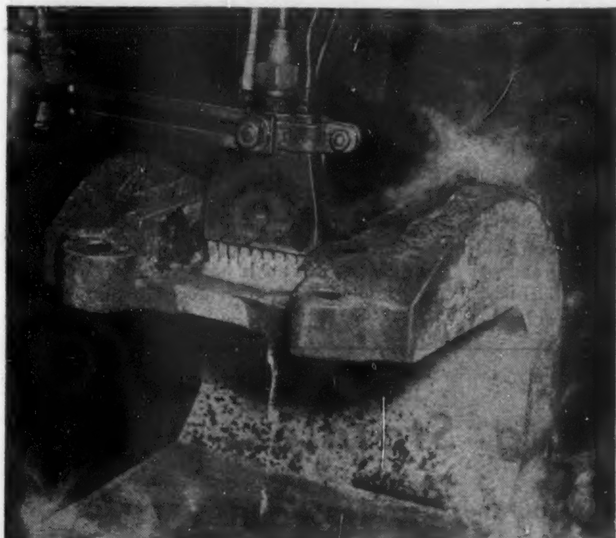
SINCE 1912 — THE COMPLETE OXY-ACETYLENE SERVICE FOR

BUY UNITED STATES WAR BONDS AND STAMPS

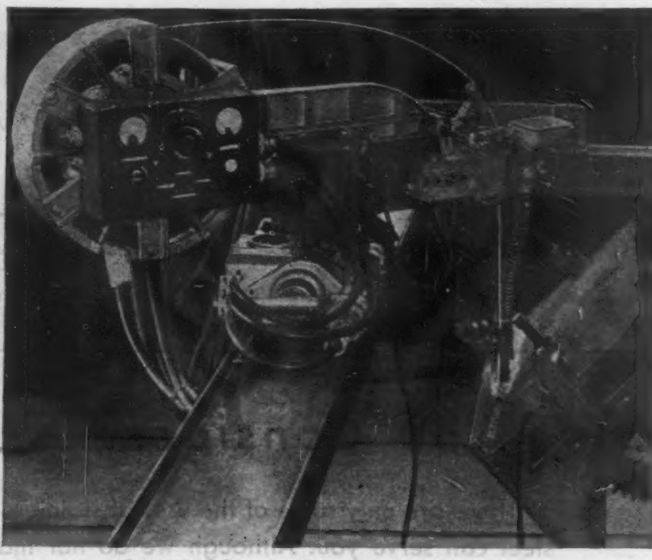
and Rebuilding Programs

● For over thirty years Oxweld has made available to the railroads, methods and equipment which have helped to maintain efficiency and to lower operating costs. Three of Oxweld's methods in general use today . . . pressure-welding of rail, flame-hardening, and UNIONMELT welding . . . are illustrated here. An Oxweld representative will be glad to tell you more about these and other Oxweld methods.

THE OXWELD RAILROAD SERVICE COMPANY
Unit of Union Carbide and Carbon Corporation
Carbide and Carbon Building UCC Chicago and New York



Flame-Hardening — By means of the oxy-acetylene flame, a wear-resistant surface case can be given to wearing parts—such as this engine truck box—at the exact points where wear occurs and without affecting the chemical composition or toughness of the core.



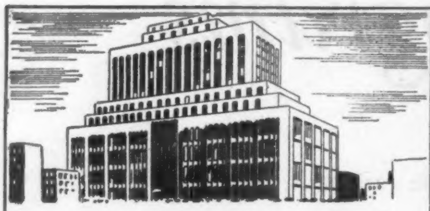
Unionmelt Welding — UNIONMELT automatic electric welding joins steel of any thickness at speeds up to 20 times faster than other methods of welding with rods . . . without sparks, spatter, smoke, or flash.

The word "Unionmelt" is a registered trade-mark of The Linde Air Products Company.

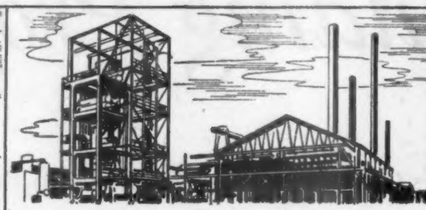
AMERICAN RAILROADS

OXWELD RAILROAD SERVICE

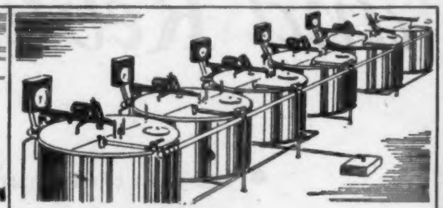
Stainless Steels Are Specified For These Applications:



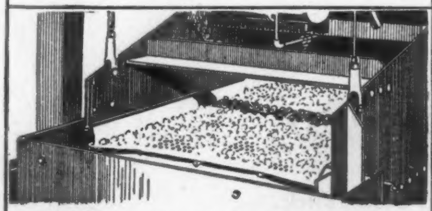
Architecture — For weatherproof exterior trim, stainless steel is not excelled in beauty or length of life.



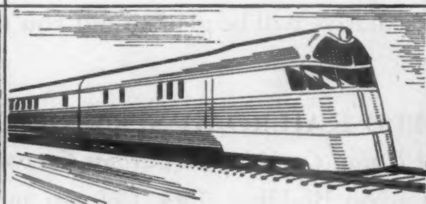
Refineries — Furnace tubes, carrying corrosive gases at high temperatures, are made of stainless steel.



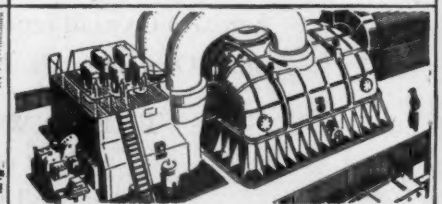
Food processors — Stainless steel milk processing equipment will not taint milk and is easily kept sanitary.



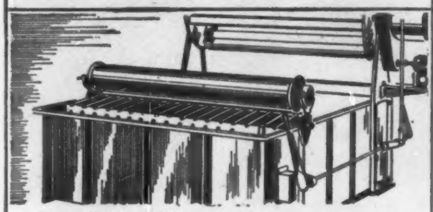
Mining — Vibrating screens of stainless steel resist abrasion and wear to give extra life.



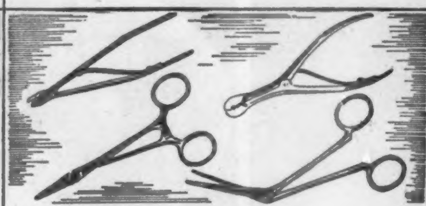
Transportation — Railroads use light-weight passenger equipment built of stainless steel.



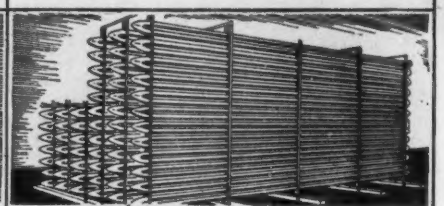
Power Plants — Stainless steel turbine blades resist corrosion and erosion of steam at high temperatures.



Textile mills — Quickly cleaned stainless steel dye vats make possible a rapid succession of dye baths.



Hospitals — Stainless steel surgical instruments resist corrosion from repeated high-temperature sterilization.



Chemical plants — Highly corrosive nitric acid is handled safely in a stainless steel condenser.

Have You Considered Using Stainless Steel?

● These are only some of the uses of stainless steel, but they may suggest how stainless steel can serve you. Although we do not make stainless steel or steel of any kind, we have had 38 years of experience in the manufacture of ferro-alloys used in the production of steel. Working closely with the steel companies and the users of stainless steel, our engineers have accumulated information on the use of stainless steel in many industries. If you want more specific details about a particular application, write to us.

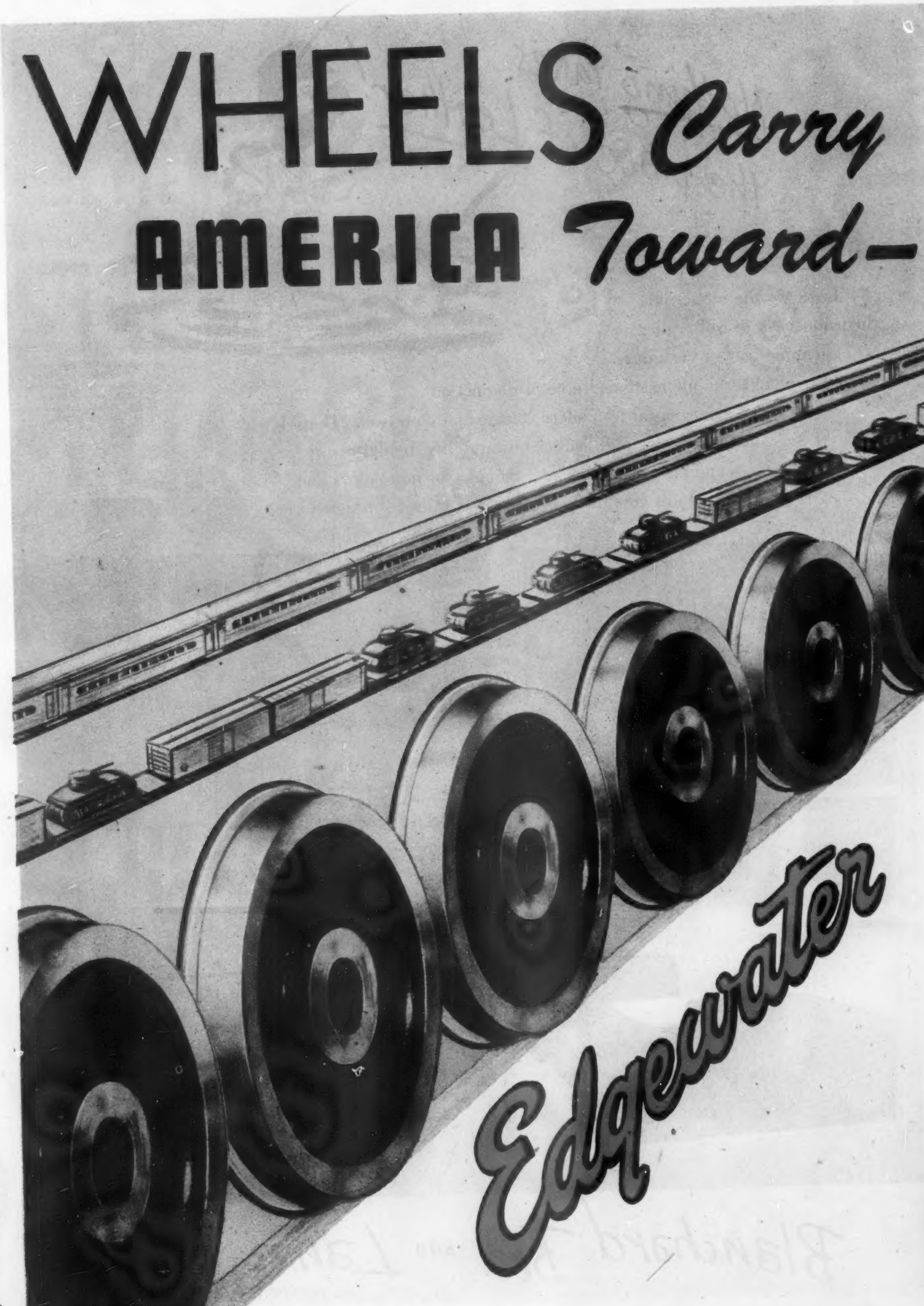
BUY UNITED STATES WAR BONDS AND STAMPS

ELECTRO METALLURGICAL COMPANY
Unit of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.
In Canada: Electro Metallurgical Company of Canada, Limited, Welland, Ontario

Electromet
Trade-Mark
Ferro-Alloys & Metals

The word "Electromet" is a registered trade-mark of Electro Metallurgical Company


KEEPS TRACKS IN
BETTER SHAPE
BARCO
TYTAMPERS
BARCO
Track-maintenance is a hard problem in times of manpower shortages. With Barco Unit Tytampers, right-of-ways can be kept in shape under adverse conditions. These powerful, self-contained units enable one or two men to do the work of a gang. Rugged in construction, versatile in performance, Barco Unit Tytampers do many jobs economically . . . tamping ballast, crib busting, breaking and drilling.
THE FREE ENTERPRISE SYSTEM IS THE SALVATION OF AMERICAN BUSINESS
BARCO
MANUFACTURING CO., NOT INC.
1800 Winnemac Avenue
Chicago 40, Ill.
In Canada: The Holden Co., Ltd., Montreal


WHEELS Carry
AMERICA Toward—
Edgewater

VICTORY, the goal toward which all efforts are now bent, is still around the corner. However. it is safe to consider, without pausing, the part played by wheels in the march toward our objective.

Wheels carry men and materiel to the fronts. Wheels move the mountains of clothing, arms, ammunition, medical supplies, and food required to support our fighting armies. Wheels, especially railroad car wheels, are prime factors in overcoming the problems of logistics.

Edgewater Rolled Steel Wheels have their share in the triumph of wartime shipping. Their part in peacetime transportation will be equally important.

EDGEWATER STEEL COMPANY
PITTSBURGH, PA.

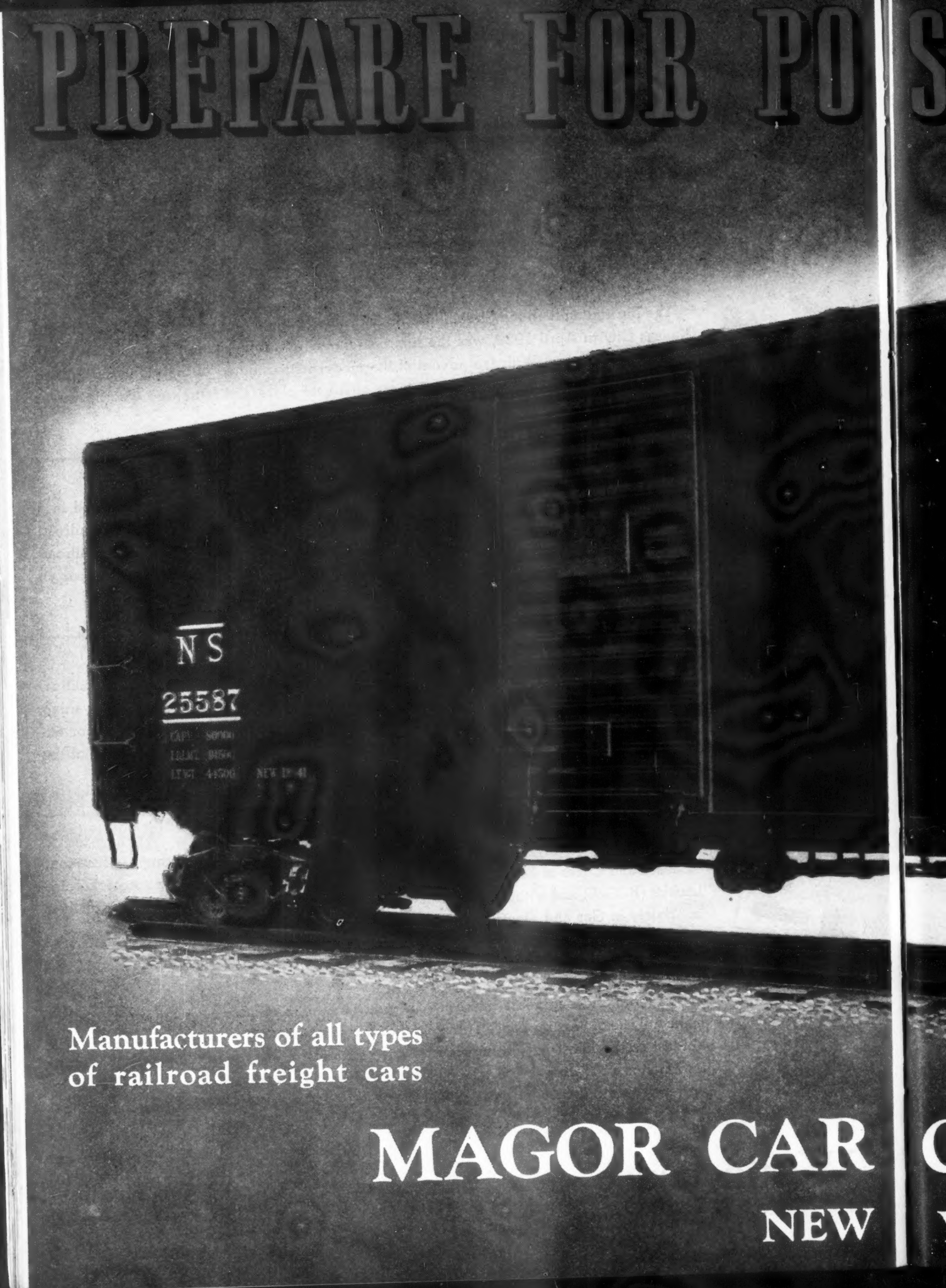
Atlanta, Ga. Baltimore, Md. Boston, Mass. Chicago, Ill. Cleveland, O. Kansas City, Mo. Louisville, Ky. New York, N.Y. Philadelphia, Penna. St. Louis, Mo. St. Paul, Minn. San Francisco, Calif. Seattle, Wash. Washington, D. C.

of rolling stock, lading and tracks, equip new and used freight cars with Barber Stabilized Trucks. Damping both the up and down movement of the spring supported bolster, the friction pressure of Barber Stabilized Trucks is in proportion to the car load — NOT A FIXED PRESSURE.

The effectiveness of Barber Stabilized Trucks is evidenced in the fact that they have been selected for over 50% of all freight cars purchased since January 1, 1944.

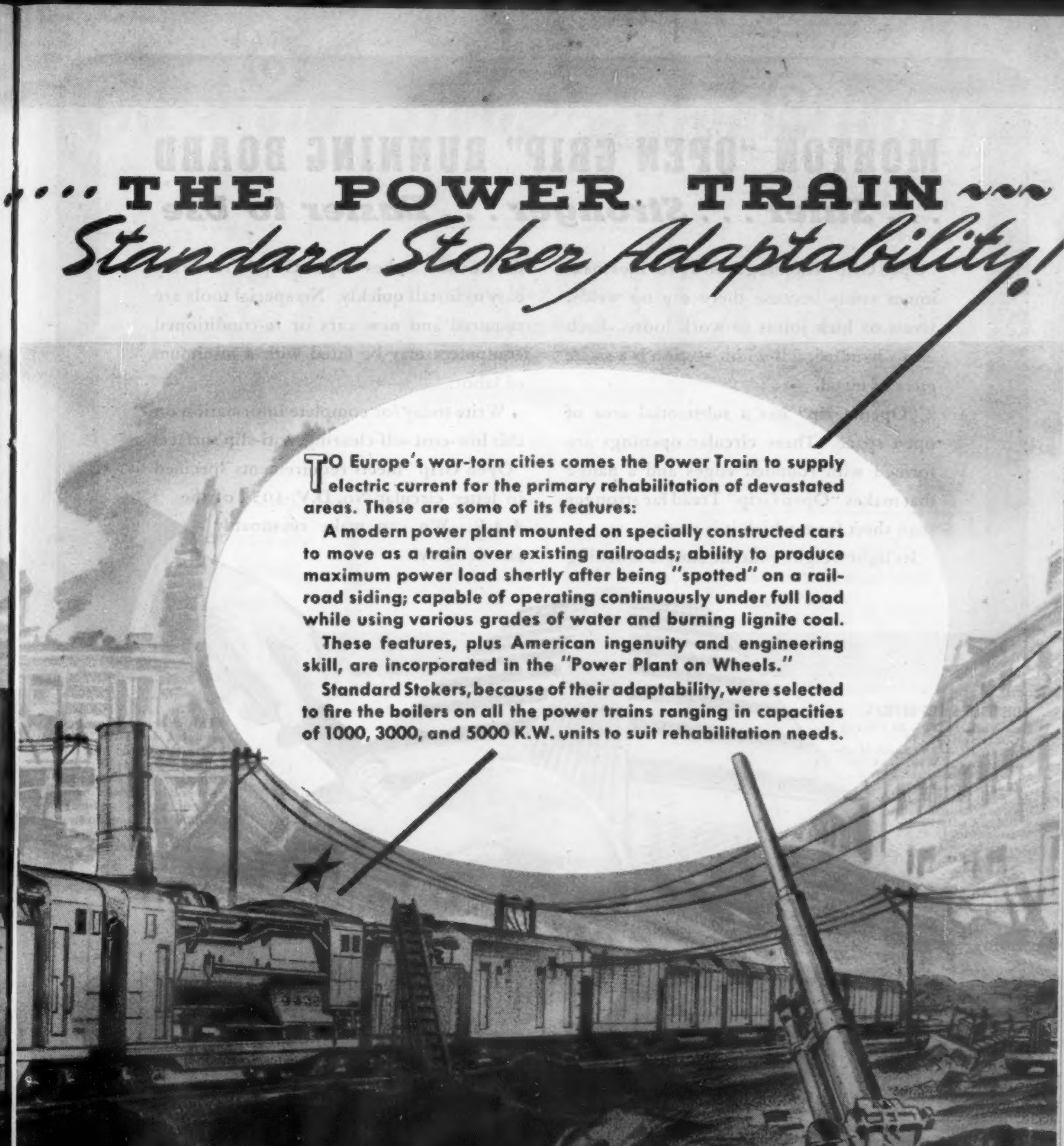
STANDARD CAR

332 SOUTH MICHIGAN AVENUE,


PREPARE FOR PO
S
NS
25587
Manufacturers of all types
of railroad freight cars
MAGOR CAR
C
NEW

IF YOU CHECK YOUR RECORDS REGARDING INSULATION THIS IS WHAT YOU WILL PROBABLY FIND
SAVE MORE FUEL WITH INSUTAPE PIPE INSULATION
Sixty-four per cent of bare pipe heat losses can be eliminated by the application of Insutape! These savings have been proven by tests conducted under still air conditions. Savings are much greater under wind velocity conditions encountered in actual operation of rolling stock! When coupled with the fact that Insutape can be used over and over again, it is easy to understand why Insutape is a standard of quality and economy on a majority of the nation's railroads.
ARMY
ARMY
UNION ASBESTOS
MEANS PROGRESS IN INSULATION
AND RUBBER CO.
COPYRIGHT 1944


TWO WAYS TO SAVE MONEY
and increase passenger comfort too
IN "ACTIVE SERVICE" FOR TWELVE UNINTERRUPTED YEARS! WOVENSTONE PIPE INSULATION
Many mechanical and operating men report that their rolling stock still is equipped with its original Wovenstone train line steam pipe insulation—equipment that was placed in service as long as twelve years ago! Wovenstone remains firm and snug against the pipe; is unaffected by the constant beating of road ballast on its surface; will not loosen, sag or shake down. It can be removed and reapplied over and over again without loss of original efficiency. That's why Wovenstone is a standard of quality and economy on a majority of the nation's railroads.
310 S. MICHIGAN AVENUE
CHICAGO 4, ILLINOIS



...THE POWER TRAIN
Standard Stoker Adaptability!
TO Europe's war-torn cities comes the Power Train to supply electric current for the primary rehabilitation of devastated areas. These are some of its features:
A modern power plant mounted on specially constructed cars to move as a train over existing railroads; ability to produce maximum power load shertly after being "spotted" on a railroad siding; capable of operating continuously under full load while using various grades of water and burning lignite coal.
These features, plus American ingenuity and engineering skill, are incorporated in the "Power Plant on Wheels."
Standard Stokers, because of their adaptability, were selected to fire the boilers on all the power trains ranging in capacities of 1000, 3000, and 5000 K.W. units to suit rehabilitation needs.
ARMY
E
NAVY
N S A
1944
COMPANY, INC.
ERIE • MONTREAL •

MORTON "OPEN GRIP" RUNNING BOARD

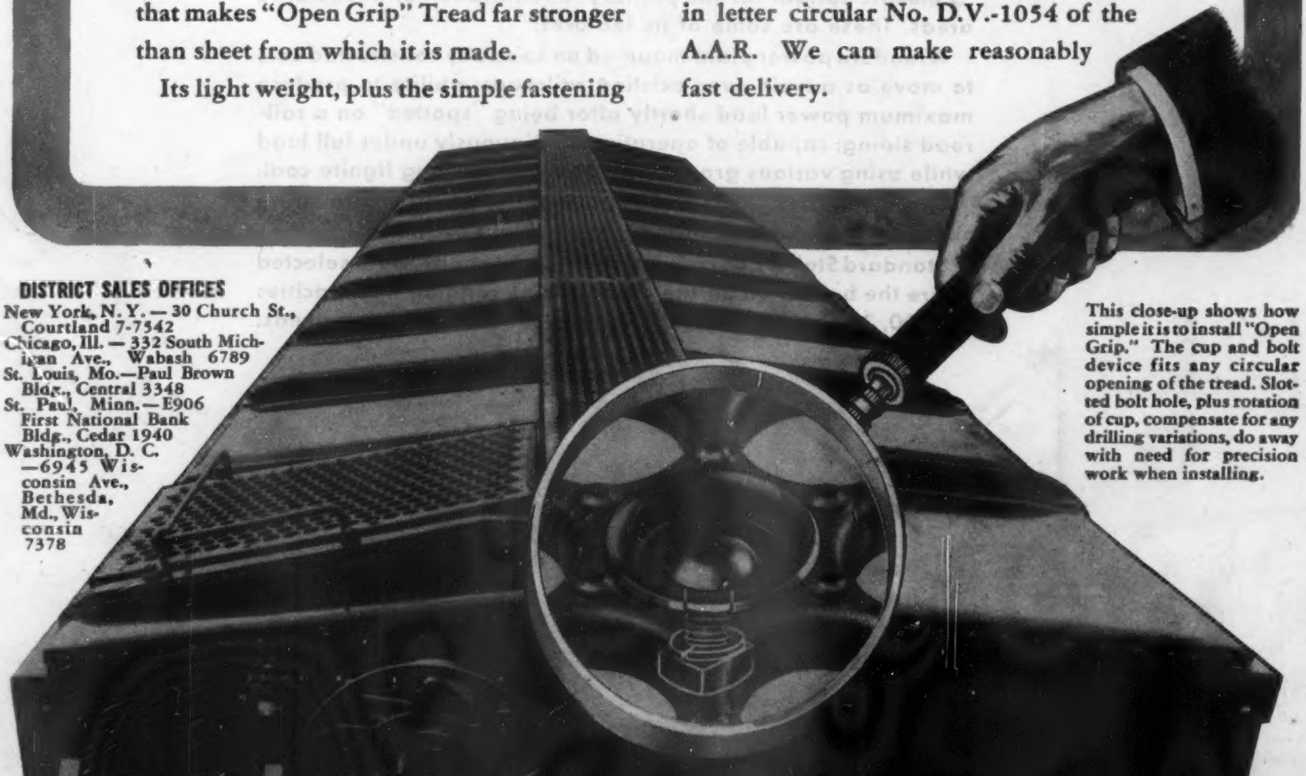
. . . *Safer . . . Stronger . . . Easier to Use*

"Open Grip" Running Board provides maximum safety because there are no welds, rivets or lock joints to work loose. Each easily handled, full-width section is a *single piece* of metal.

"Open Grip" has a substantial area of open space. These circular openings are formed with rounded edges and a flange that makes "Open Grip" Tread far stronger than sheet from which it is made.

Its light weight, plus the simple fastening device used, makes "Open Grip" Tread very easy to install quickly. No special tools are required and new cars or re-conditioned equipment may be fitted with a minimum of labor.

Write today for complete information on this low-cost self-clearing, anti-slip surface. "Open Grip" meets requirements specified in letter circular No. D.V.-1054 of the A.A.R. We can make reasonably fast delivery.



DISTRICT SALES OFFICES

New York, N. Y. — 30 Church St., Courtland 7-7542
Chicago, Ill. — 332 South Michigan Ave., Wabash 6789
St. Louis, Mo.—Paul Brown Bldg., Central 3348
St. Paul, Minn.—E906 First National Bank Bldg., Cedar 1940
Washington, D. C. —6945 Wisconsin Ave., Bethesda, Md., Wisconsin 7378

This close-up shows how simple it is to install "Open Grip." The cup and bolt device fits any circular opening of the tread. Slotted bolt hole, plus rotation of cup, compensate for any drilling variations, do away with need for precision work when installing.

MORTON MANUFACTURING CO.

5105 WEST LAKE STREET • CHICAGO 44, ILLINOIS

Congratulations

TO THE RAILROADS OF AMERICA

Timken Roller Bearing Outboard Application for all types of new high-speed freight car trucks.

The railroads of America have done a wonderful job during the past year and preceding war years in handling the unprecedented volume of traffic necessary to the carrying on of a world-wide war. It is truly a great achievement. Congratulations!

We believe the future is bright for the railroads in the coming post-war years, and rededicate Timken Bearings to the tasks they have proved themselves so well able to handle in the past.

Timken Bearings will make the problem of higher speed easy of solution as far as journal bearings are concerned. They will give the same trouble-free service on freight cars and passenger cars, locomotives and streamlined trains. The Timken Roller Bearing Company, Canton 6, Ohio.

★ **TIMKEN** ★

TRADE MARK REG. U. S. PAT. OFF.

RAILWAY ROLLER BEARINGS

★ ★ ★ ★ ★

A Small Purchase That May Cost You $1000

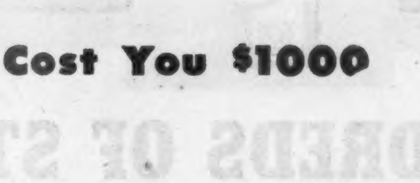
When one of your workers suddenly claps a hand over an injured eye, it frequently means a lifetime handicap for him . . . and *always* increases your cost of operation.

For the glass eye you may have to buy him is only a small part of your total expenditure . . . which can easily amount to $1000 or more before you are through.

Yet all this can usually be avoided for as little as $1.50 per man—75c an eye—the price of scientific AO eye protection. For these AO Safety Goggles protect each worker on his particular job . . . help him to *concentrate.*

Your Safety Director would welcome *your* help in establishing an adequate goggle program. Why not discuss this with him, and call in an AO Safety Engineer to make an eye-hazard survey of your plant? You'll find it's a short cut to lower production costs.

American Optical
COMPANY
SOUTHBRIDGE, MASSACHUSETTS



Covering North America With Security

Ranging a continent – Ceaselessly searching out the hidden "Fifth Column" transverse fissures and other internal rail defects. The detector car fleet of Sperry Rail Service has assured the land of extra safety in rail transportation.

The remarkable war-time record of American railroading has been made possible by the unstinted efforts of railroad personnel, backed by the best of equipment. Sperry's record of track-miles tested is also based on the willingness of trained personnel, backed by the finest of equipment – The Sperry Detector Cars.

— A Sperry contribution in peace and war —

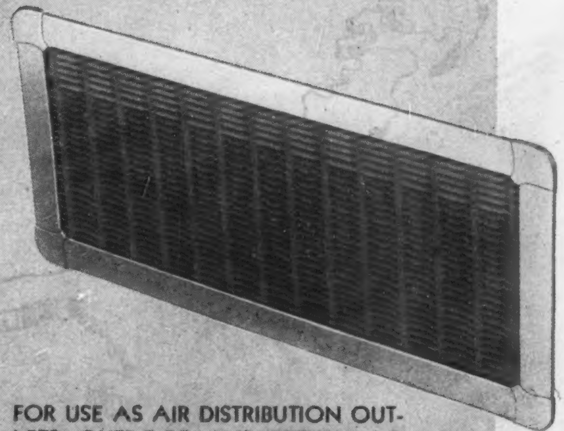
SPERRY Rail Service

SPERRY PRODUCTS INCORPORATED

HOBOKEN, NEW JERSEY
CHICAGO, ILLINOIS

BARBER-COLMAN

PRODUCTS FOR RAILWAY SERVICE



FOR USE AS AIR DISTRIBUTION OUTLETS, OUTDOOR AND RETURN AIR REGISTERS AND TRANSFER GRILLES FOR COMPARTMENT DOORS.

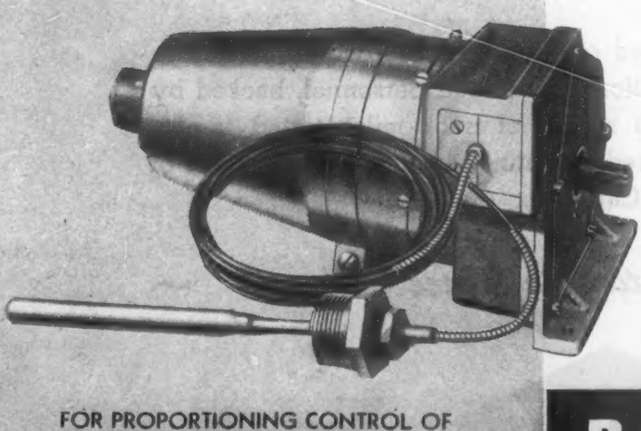
uni-flo
GRILLES *and* REGISTERS

UNI-FLO Grilles and Multi-louver Registers are ideal for railway service. They are fabricated of *sheet steel.* The core construction is *rigid.* The fin strips are folded and have pressed-in support bars to give a firm interlocking assembly. Registers have a series of one inch wide overlapping blades to *provide tight shut-off.*

FOR OVERHEAD AIR DISTRIBUTION IN PASSENGER CAR SPACES, SMOKING ROOMS, AND PASSAGEWAYS.

venturi-flo
CEILING OUTLETS

VENTURI-FLO Ceiling Outlets are fabricated of *spun steel* members, and have been designed for center duct air distribution systems. They have flow characteristics similar to those of the well-known fluid flow measuring device, the Venturi meter. When desired, provision can be made for quick removal of the unit for cleaning the supply duct.



FOR PROPORTIONING CONTROL OF DIESEL ENGINE OIL AND COOLING WATER TEMPERATURES.

SELF-CONTAINED
POWER UNITS

Self-Contained Power Units have been designed for automatic control of oil and cooling water temperatures. These accurate and dependable units maintain temperature by positioning the cooler shutters. They give true proportioning operation without overrun or "hunting".

BARBER-COLMAN COMPANY

ROCKFORD • ILLINOIS

Do you have these
GOULD Catalogs?
There's a Gould catalog for every major storage battery application. Each is designed to help storage battery users. Write for copies today; they're yours for the asking.
GOULD SEALED-IN-GLASS BATTERIES AND RACKS
FOR STATIONARY APPLICATION
AIRCRAFT BATTERY INSTRUCTION MANUAL
GOULD RAILWAY SIGNAL BATTERIES
THE SIGNALMAN'S BATTERY MANUAL
GOULD KATHANODE GLASSKLAD BATTERIES
FOR MINE SHUTTLE CAR SERVICE
FOR CAR LIGHTING AND AIR-CONDITIONING SERVICE
FOR INDUSTRIAL TRUCK AND TRACTOR SERVICE
FOR MINE LOCOMOTIVE SERVICE
FOR DIESEL LOCOMOTIVE SERVICE
ARMY NAVY
For excellence in storage battery production at Depew plant
GOULD
SINCE 1898 . . . THE BATTERY PICKED BY ENGINEERS
Dept. 51, GOULD STORAGE BATTERY CORPORATION
Depew, New York
Send me the following Catalogs:
☐ 100—Industrial Truck Batteries
☐ 200—Mine Locomotive Batteries
☐ 300—Shuttle Car Batteries
☐ 400—Aircraft Instruction Manual
☐ 700—Diesel Locomotive Batteries
☐ 800—Railroad Carlighting and Air-Conditioning Batteries
☐ 900—Railroad Signal Batteries
☐ 1000—Stationary Batteries
Name ____ Title ____
Firm ____
Street ____ City and State ____
Factories: Atlanta • Chicago • Dallas • Depew • Leavenworth • Los Angeles
North Bergen • Rock Island • Saint Paul • Sioux City • Zanesville

Bridge structures like this, and many other types equally modern, will be needed to carry the giant, fast trains in the peacetime era. American Bridge Company stands supreme in its capacity to fabricate and erect them or any other needed railroad structure, from turntables to buildings.

A glimpse into the future while your eyes are on the present

NEVER in their history have America's railroads faced a test to match that of this war emergency. Never have they more completely demonstrated their ability to accomplish the seemingly impossible.

The entire operation has been precedent-breaking. Troops, civilians, raw materials and finished products have been moved in numbers and volume with incredible speed and dispatch.

The job is by no means through. It must continue as long as war lasts despite increasing wear and tear on equipment and serious shortages in man power. The utmost is still asked and the carriers have proved that they can and will give it.

Every railroad man knows what high speeds, great loads and ceaselessly pounding traffic does to equipment, roadbeds and structures. That these have stood up and will continue to do so is a monument to foresight, unceasing vigilance and well engineered upkeep and repairs.

But no railroad man, either, doubts for a moment that the future calls for great planning. One glimpse is all that is needed to see that a vast rehabilitation program is inevitable. America, alert to wartime achievements, will demand in peacetime competition a continuance of exceptional service with even greater assurance of speed, comfort and safety. This means changes and improvements in everything from roadbeds to equipment. It means old structures modernized and strengthened, new and better ones built. It means profiting by technological advances in materials and equipment.

When that welcome time arrives, and it may not be long in coming, we, too, will be able to put aside our war job and take on the tasks of peace. Then you will find American Bridge Company better able than ever to help you; ready with unsurpassed facilities, with greater-than-ever resources and experience, to tackle your every structural problem.

AMERICAN BRIDGE COMPANY

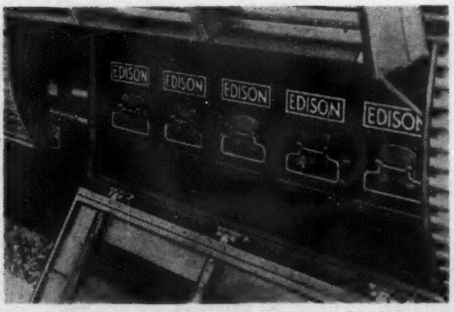
General Offices: **Frick Building, Pittsburgh, Pa.**

District Offices in: **Baltimore · Boston · Chicago · Cincinnati · Cleveland · Denver · Detroit · Duluth · Minneapolis · New York · Philadelphia · St. Louis**

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* **United States Steel Export Company, New York**

UNITED STATES STEEL

POST-WAR POWER INSURANCE...



An alkaline battery in the battery compartment saves weight where it counts most — near the middle of the car. The larger the kilowatt-hour capacity, the greater is the weight that can be saved by using an alkaline battery.

IT MAKES no difference which electrical system you may decide to use in new post-war passenger cars—32-volt, 64-volt or 110-volt—you can be certain that Edison Alkaline Batteries will provide standby power of unequaled dependability. They operate equally satisfactorily with any of these systems. Installations of 25-cell, 50-cell and 88-cell batteries have been used successfully with all three for many years.

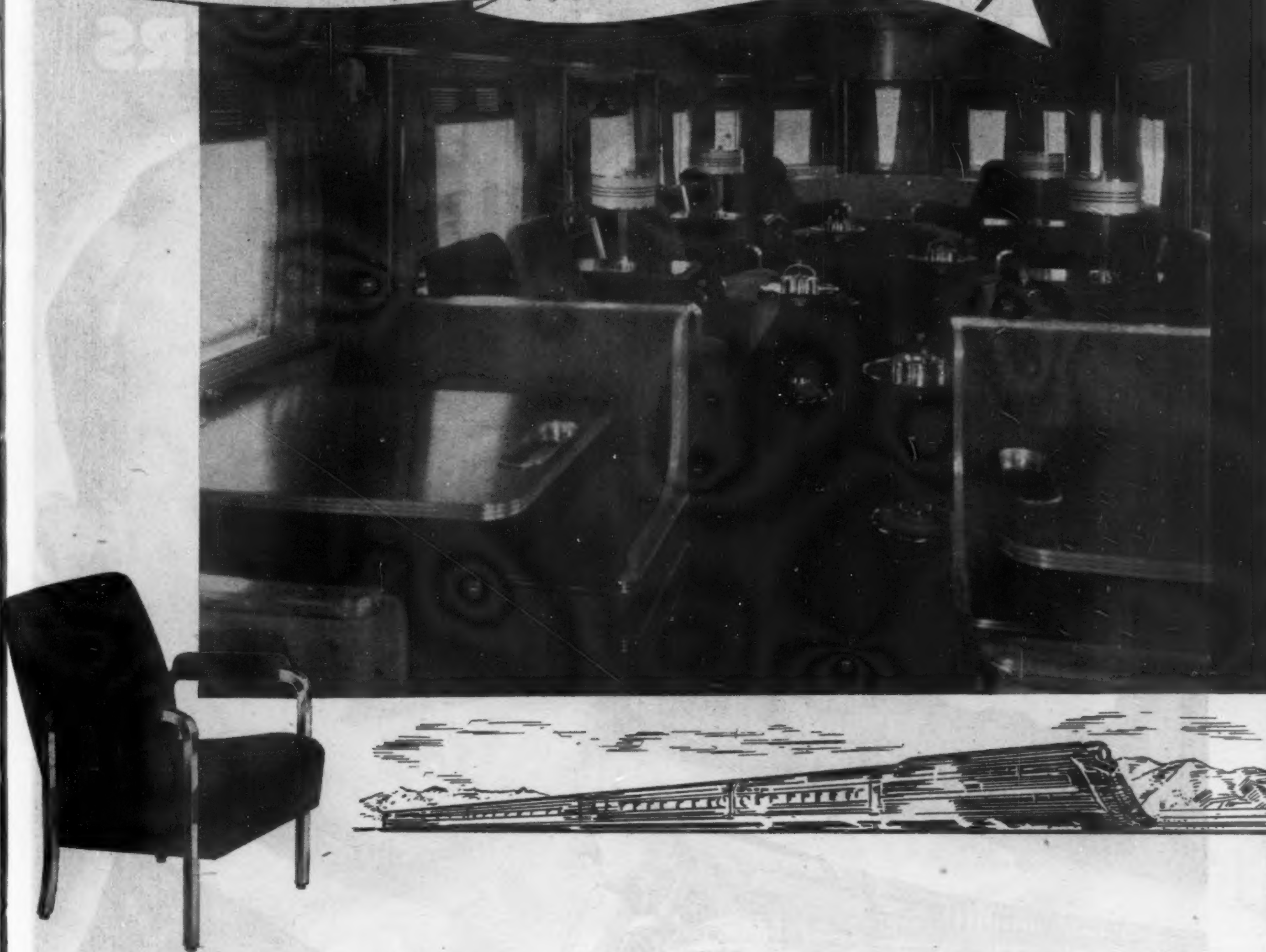
In fact, alkaline batteries have proved so dependable that, after delivering normal service life on passenger cars, they are often reapplied to baggage, express or other cars having smaller load demands. There they give additional years of unfailing service. Thus, you have full assurance that alkaline batteries will provide the power insurance necessary for utmost passenger comfort and convenience on your post-war cars. *Edison Storage Battery Division of Thomas A. Edison, Incorporated, West Orange, New Jersey.*

Edison

THE LIGHT WEIGHT BATTERY
FOR LIGHT WEIGHT CARS


Tomorrow's
POWER
Today!
F M
It's the
Opposed-Piston Diesel
Locomotive by
FAIRBANKS-MORSE
Fairbanks-Morse
A name worth remembering

AMERICA . . . a MUST in the Itinerary



First consideration in the minds of the American people . . . speedy and victorious termination of the war.

Then . . . soldiers of war and soldiers of production will want to see the world . . . first of all . . . their own Country. The railroads will safely carry them . . . in comfort . . . from ocean to ocean . . . from Canada to Mexico.

The railroads have done a magnificent job throughout the war period . . . and upon this foundation of distinguished service . . . they face the new travel-era with confidence.

When men and metal and machines are again free to serve the needs of a peacetime world, we shall build Aluminum Chairs . . . Tables . . . and other items of equipment . . . harmonious in color . . . relaxing in comfort . . . styled to serve with distinction.

GF

THE GENERAL FIREPROOFING COMPANY • Youngstown 1, Ohio

METAL DESKS • ALUMINUM CHAIRS • METAL FILING CABINETS • STEEL SHELVING • FILING SUPPLIES • SAFES • STORAGE CABINETS

"Every railroad is a part of the social, business and industrial life of every community it touches. You see, railroads are not only big buyers of materials and equipment in many diversified fields, but they provide the necessary transportation facilities for both passengers and freight without which no community could prosper. Our interests are interdependent. Realizing this, you can understand why I read The Wall Street Journal daily, and the New York Central advertises in it regularly. My associates and I depend upon it to keep us posted day by day on all the developments in business that in turn might affect our business. Truthfully, the financial news it publishes means less to me than the accuracy of its business news."

F H Baird

F. H. BAIRD
General Passenger Traffic Manager
New York Central Railroad

*Like most important business news, this story appeared first in The Wall Street Journal. That's why this national daily is "must" reading for business men who need to be fully, accurately and quickly informed. And that's what provides such an unusually responsive audience for advertisers.

The ONLY National Business Daily
Published simultaneously on both coasts

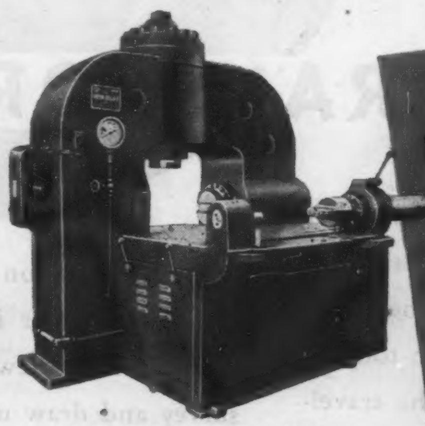
SPEED UP ASSEMBLY AND MAINTENANCE *with W-S Hydraulic Shop Equipment*

For fast, accurate assembly and maintenance jobs in railroad roundhouses and shops, Watson-Stillman hydraulic equipment answers today's demands, helps maintain uninterrupted traffic movement.

The power units and circuit designs built into W-S railroad equipment provide smooth, shockless press operation and pulsationless pressure application in forcing, driving, bushing, straightening, bending and lifting applications. Simplicity of their design and ruggedness of construction assures long, trouble-free service.

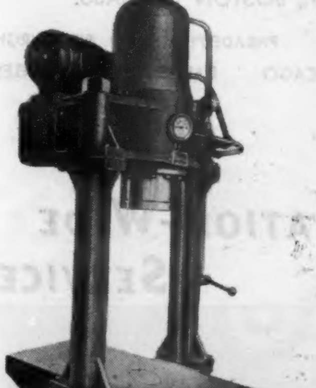
Portable and power-driven rail benders, bushing presses, wheel presses, crankpin and forcing presses, jacks, pit jacks and pulling jacks, spring shop equipment and Walter Stock adjusting machines are among the range of equipment available. These machines have been developed and perfected from a background of engineering and hydraulic experience acquired in serving railroad requirements for over 60 years. *The Watson-Stillman Company, Roselle, New Jersey.*

PIT JACKS
With telescopic and plain rams; air-driven or double-plunger hand pumps.



SPRING BANDING PRESS
Vertical moving-down ram and horizontal clamping ram; assembly table and auxiliary ram.

WHEEL PRESSES
Straight or Inclined. Completely hydraulic, full hydro-pneumatic, plain hydraulic, or hand powered.



BUSHING PRESSES
With plain or U-slotted pedestal type beds.

WALTER STOCK ADJUSTING MACHINE
For lengthening, straightening or shortening locomotive parts. Equipped with motor-driven pump.

SPRING STRIPPING MACHINE
100-ton capacity; self-contained oil pump and control.

POWER-DRIVEN RAIL BENDERS
100-ton capacity.

SPRING FORMING PRESS
Available for either hydraulic or pneumatic power.

CRANK PIN & FORCING PRESSES
With hand pumps, rack and pinion pullback, with air or motor-driven pump and hydraulic pullback.

PORTABLE RAIL BENDERS
Hook or hinged — Yoke types; for flat, "T", girder and guard rails.

SPRING TESTING MACHINE
50-ton capacity, weight springs up to full working load.

PULLING JACKS
Adjustable, three-leg mounting; self-contained cylinder and pump.

WATSON-STILLMAN

Designers and manufacturers of hydraulic equipment, forged steel fittings and valves

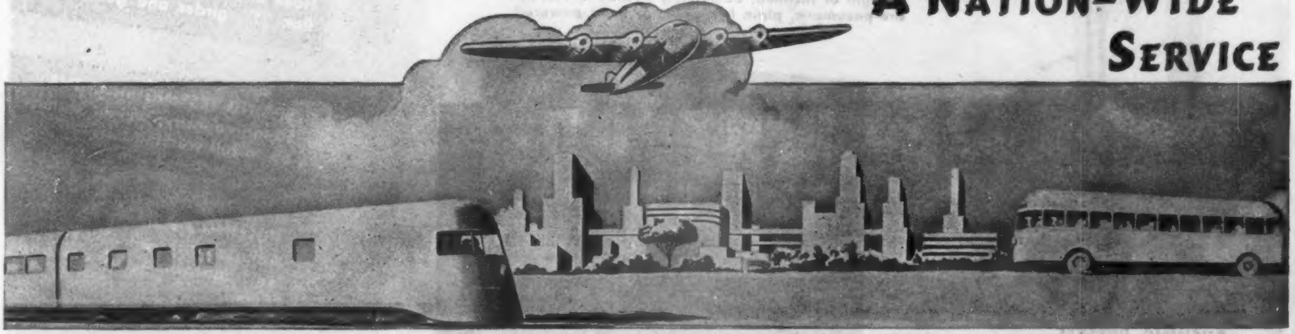
an
integral part of
MODERN TRANSPORTATION

As the *key* to the lock . . . as the *lock* to the locker . . . so is the modern *parcel locker* to streamlined transportation! They fit. They go together. Self-service parcel lockers add to the sum total of good will and appreciation which the travel-wise traveler of today has for the marvelous service of the transportation companies. He looks for this convenient, safe, time-saving service wherever he stops for an hour or a day . . . it's the modern way and the key is his check. . . . no waiting in line. . . . our consultants are ready to confer with you immediately without obligation regarding the installation of lockers, or their inclusion in your plans for renovation or new building. May we make a survey and draw up recommendations on this same no-obligation basis?

AMERICAN LOCKER COMPANY, Inc.
211 CONGRESS ST., BOSTON 10, MASS.

BOSTON NEW YORK PHILADELPHIA PITTSBURGH
ATLANTA CLEVELAND CHICAGO DALLAS LOS ANGELES

A NATION-WIDE SERVICE



TRAVEL-WISE TRAVELERS LOOK FOR PARCEL LOCKERS FIRST

EXIDE POWER

DIESEL POWER

TEAMMATES
. . . for the "long pull"

BACK in the days when Diesel engines first commanded attention, Exide engineers began the development of a battery specially designed for Diesel cranking. As Diesels grew in size and power, Exide development kept pace. And when the great Diesel locomotives began roaring over the rails there were powerful Exide Batteries ready to take on the cranking job.

Today, on many of America's busiest railroads, Exide Batteries are performing a multitude of tasks—cranking Diesels, powering the signal and train telephone systems, lighting and air-conditioning passenger cars, etc. And wherever Exides are used, they are performing dependably, with long-life and ease of maintenance. When you buy an Exide, you *Buy* to *Last*.

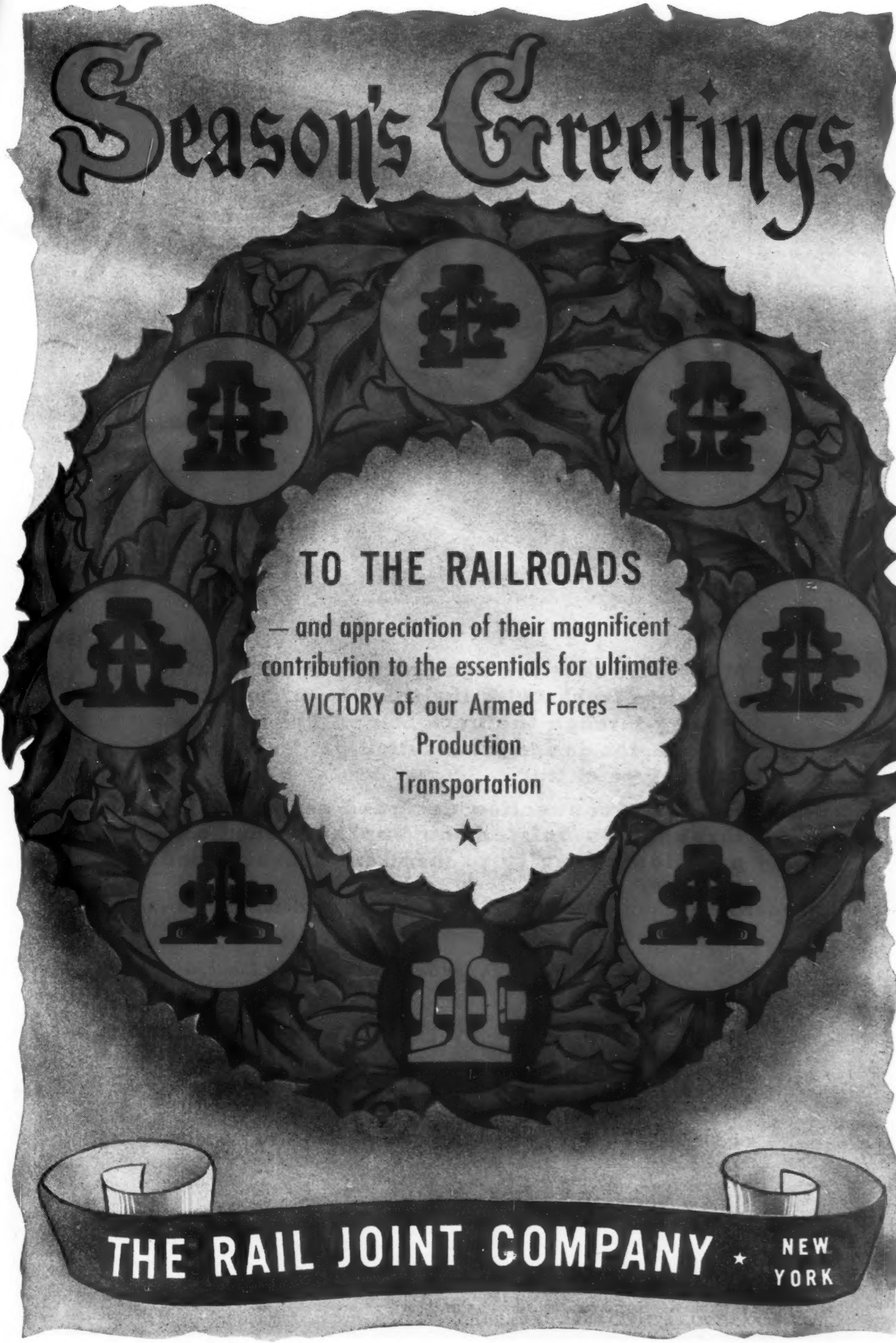
ARMY E NAVY

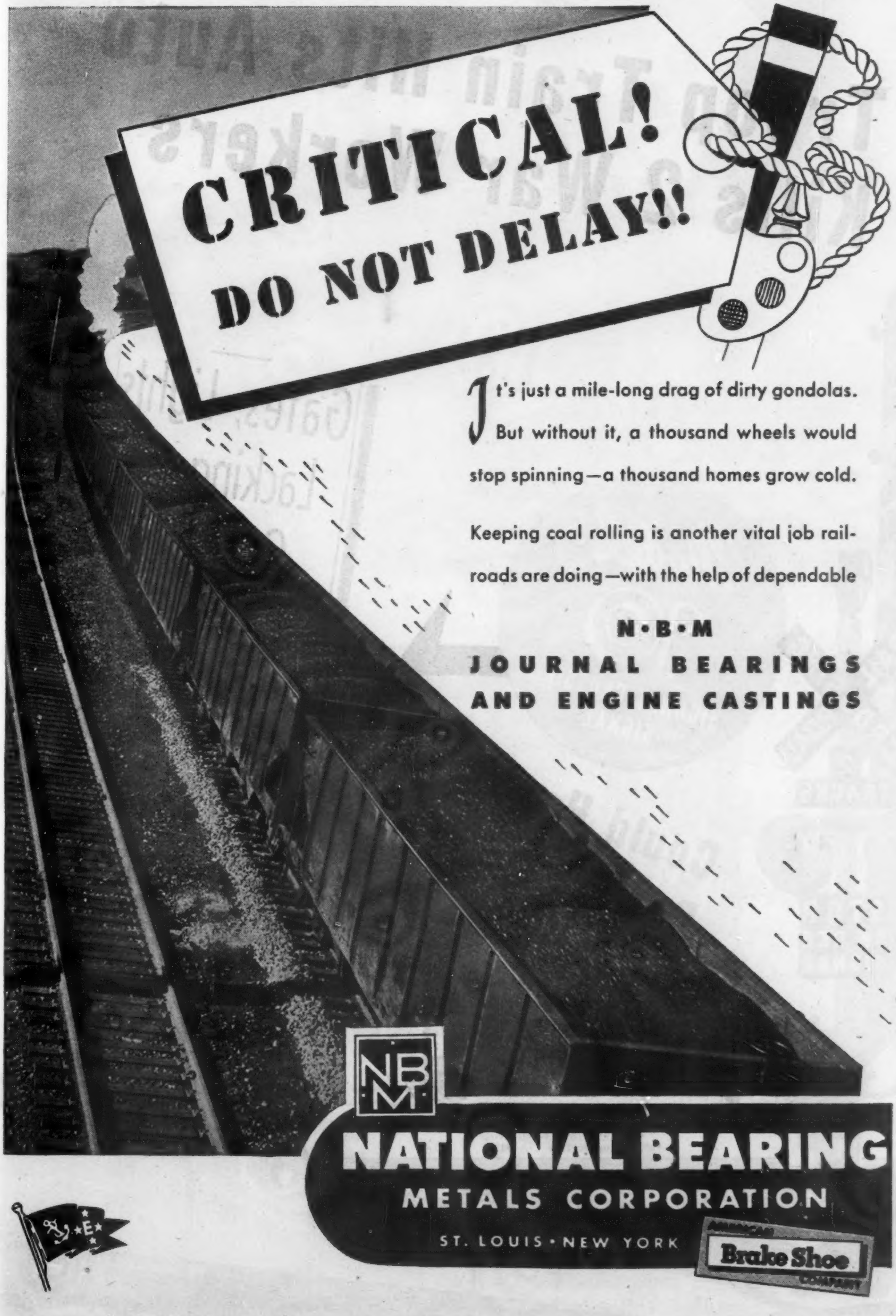
Exide
BATTERIES

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 32
Exide Batteries of Canada, Limited, Toronto

T

S
ll"


Season's Greetings
TO THE RAILROADS
— and appreciation of their magnificent
contribution to the essentials for ultimate
VICTORY of our Armed Forces —
Production
Transportation
THE RAIL JOINT COMPANY
NEW
YORK


CRITICAL!
DO NOT DELAY!!
It's just a mile-long drag of dirty gondolas. But without it, a thousand wheels would stop spinning—a thousand homes grow cold.
Keeping coal rolling is another vital job railroads are doing—with the help of dependable
N•B•M
JOURNAL BEARINGS
AND ENGINE CASTINGS
NBM
NATIONAL BEARING
METALS CORPORATION
ST. LOUIS • NEW YORK
Brake Shoe
COMPANY


Troop Train Hits Auto
Kills 2 War Workers
RAILROAD CROSSING
2
TRACKS
STOP ON RED SIGNAL
Model 10
HIGHWAY CROSSING SIGNAL
Could Have Prevented THIS
Gates, Lights Lacking at Crossing
Two war workers were killed and two others were injured, one seriously, early today when the car in which they were returning from work at the
was struck by
place.
who suffered cuts and bruises, told police that [redacted] stopped behind another car at the crossing, which is not protected by crossing gates or blinker lights. Then, she said, he backed up and drove around the waiting car into the path of the 13-coach troop train.
Mrs. [redacted] suffered a possible skull fracture and internal injuries. She was taken to Holy Cross Hospital, where her condition was described as serious.
Mrs. [redacted] was sent home after treatment at the hospital.
BUY WAR BONDS
6 WAR LOAN
* U.S. Patent No. 2,137,196
Pat. in Canada June 27, 1939

EQUIPCO PUMP-HANDLE BRAKE FOR DROP-END GONDOLA CARS

The Equipco Pump-handle Brake is especially designed for drop-end gondola cars. Although both vertical wheel and pump-handle type brakes have been used on this type of car, experience has proven the Pump-handle Brake to be the only brake which can be SAFELY and CONVENIENTLY operated. The Equipco Pump-handle Brake places operator in a SAFE, CONVENIENT operating position, within the car sides.

Vertical Wheel Brakes, on the other hand, create definite SAFETY HAZARDS to trainmen. They require: operation from side ladder; a SPECIAL mounting plate which projects excessively toward adjacent car, and a SPECIAL, deep striker casting to provide safety clearance between the projecting plate and adjacent car. Side ladder operation of any hand brake is dangerous and the original, proposed Specifications for Hand Brakes prohibited such operation.* To avoid the dangers of side ladder operation, the operator must climb precariously around the brake and mounting plate, to reach the brake platform (IN MANY CASES NOT PROVIDED). If a platform is provided and he reaches it, he finds himself facing the back of the brake; he has nothing to hold on to while operating the brake; has the poorest of leverage; he must turn the brake wheel in counter-clockwise direction and operate the release lever in reverse to that on any other vertical brake—these reversals of operation being contrary to one of the most important objects of the Brake Specifications—the STANDARDIZATION OF OPERATION of all hand brakes of a given type.

The Equipco Pump-handle Brake is less expensive to install; requires no special mounting plate or striker casting; operates in accordance with A. A. R. Specifications and cannot be operated from side ladder.

*A. A. R. Circular D.V. 846 of 5/27/35.

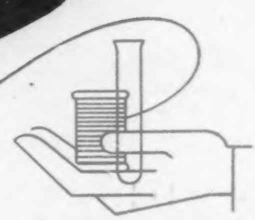
EQUIPMENT SPECIALTIES DIVISION

of Union Asbestos and Rubber Company

310 South Michigan Ave. Chicago, Illinois


"RAILWAY" SPRINGS
DELIVER
TROUBLE-FREE SERVICE
NECESSARY FOR
REDUCED MAINTENANCE
AND
OPERATING CHARGES
Exactly the right kind of spring to meet the most rigid requirements.
Alco
AMERICAN LOCOMOTIVE COMPANY
RAILWAY STEEL-SPRING DIVISION
30 CHURCH STREET NEW YORK 7, N. Y.

Undreamed-of color effects now practical at last...with VELON*



Tomorrow's great appeal in transportation competition will be *luxury!*

And you can offer it with interiors of striking new beauty—brighter, lighter, more cheerful than ever before believed practical.

You can do it with *Velon*—Firestone's new wonder-fabric, the completely new, utterly different kind of upholstery material.

Velon makes every color possible, any color practical. For the first time you can dare to use the palest of pastel tints or the deepest of dark tones in an infinite variety of weaves and patterns. There's no limit with *Velon!*

No matter what the color, *Velon* comes back new—clean and bright at a mere wipe with a damp cloth or cleaning fluid. Grease won't hold. Dust can't cling. Water won't absorb. It's stainless, non-inflammable and non-fading.

And if you're thinking of replacement and upkeep costs consider this:

Velon is virtually everlasting. That's been proved by years of the hardest imaginable use—on thousands of car, bus, train and cab seats. Not one of these *Velon* seats has lost its original colorful, bright new beauty.

You can't afford to pass up the limitless possibilities of this amazing new material for interiors. Right now, all the *Velon* produced goes to the armed forces. But you can start now to include *Velon* in your postwar planning.

P.S. For completely modern seating use Foamex cushioning, Firestone's rubber latex foam.

ANOTHER CONTRIBUTION TO A BETTER WAY OF LIFE *by* **Firestone**

Listen to the Voice of Firestone Monday Evenings over NBC

*Trade Mark—Pronounced VEL-LÓN


FLASH! . . AVAILABLE
NOW . . . NEW EDWARDS
DOUBLE GLAZED DEHYDRATED
. . . SASH
No Fog
No Film
No Frost


SASH FOR EVERY TYPE OF TRANSPORTATION—ON LAND, ON THE SEAS, IN THE AIR

★ ★

They shall not be forgotten

WHEN the tumult and the shouting dies . . .

When it's all over over there in Europe and our boys and girls start coming home . . .

Shall we forget their courage and devotion, the sacrifice of the best years of their lives, the dangers they faced unflinchingly for us?

It is inconceivable.

No, *they* shall not be forgotten.

★ ★ ★

Nor in the days ahead, when an indomitable people turns to the "beating of swords into ploughshares," shall be forgotten Labor's stalwart stand and contribution to Victory . . .

Nor Management's, so largely responsible for the awesome miracle of production which electrified free men everywhere and saw democracy's forces the best equipped, best clothed, best fed the world has ever known . . .

Nor the "little people" of the nation who, quietly on the home front, served in their myriad ways . . . Neither shall these be forgotten.

★ ★ ★

And while saluting those who made more conspicuous contributions, let us also give recognition to those manufacturers and service organizations who, in the face of difficulties that seemed insurmountable, served so valiantly to keep our vital domestic economy moving.

When the going was hardest, when everyone was clamoring for goods and services of which there were not enough to go around, they did their best . . . they came through!

These too shall be gratefully remembered in postwar years.

Though war's imperious demands have preempted a large part of our production capacity, we know that the Nation's Railroads—themselves doing a magnificent job under unprecedented difficulties—recognize the part that Rosemary Napery has played in maintaining their dining service standards.

In peace as in war, Rosemary offers a dependable source for your particular requirements . . . with permanently finished, lintless TABLECRAFT* *(Rosemary-Basco) Cloths and Napkins . . .* "Made right, *in America!"*

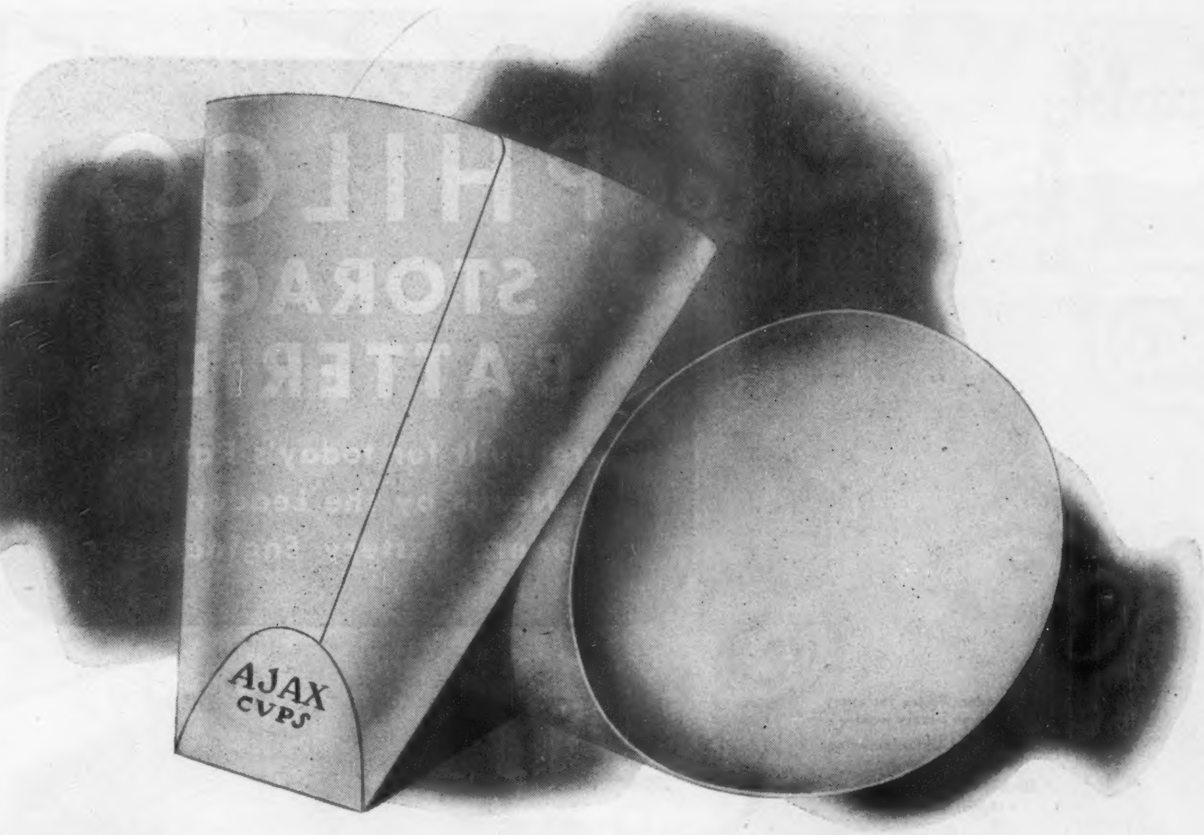
*Reg. U. S. Pat. Off.

ROSEMARY SALES

ROSEMARY PRODUCTS

A Division of Simmons Company

Dept. 3-B—40 WORTH ST., NEW YORK 13, N. Y.



WHY AJAX CONTINUES TO BE THE IDEAL PAPER DRINKING CUP FOR RAILWAY DRINKING WATER SERVICES . . .

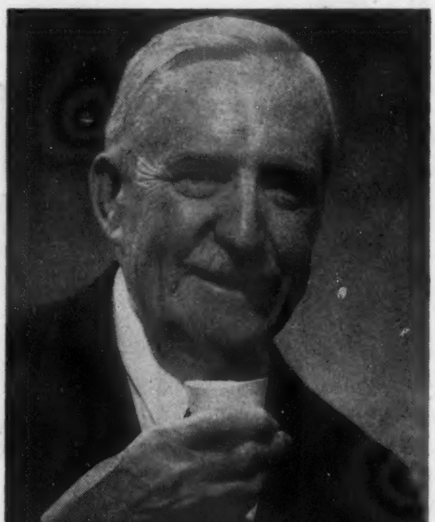
1. *It's passenger proved!* In other words, anyone can withdraw an AJAX from its dust-tight dispenser, fill it with water, and drink easily and naturally . . . even on moving trains.

The hand grasps the cup, which is open and ready for use. The oval shape fits into the hand naturally. Genuine AJAX cups have no side crease. The bottom of the cup, specially constructed to prevent leakage, provides a firm base for holding the cup with no danger of the filled cup slipping through or out of the hand. The cup can be used from any side without "nose interference."

The No. 4 AJAX holds sufficient water for a satisfying drink without waste.

These are all vital considerations, of first importance when choosing paper cups for railway water service.

2. *It's railroad proved!* AJAX cups are delivered to you — nested — 250 cups in each dust-tight carton. The AJAX dispenser, made of steel, attractively designed, of unit construction with no parts to break or fittings to become lost, is filled directly from the carton, thereby eliminating handling of the cups themselves. This means "ultra-clean" cups for your passengers.



* * *

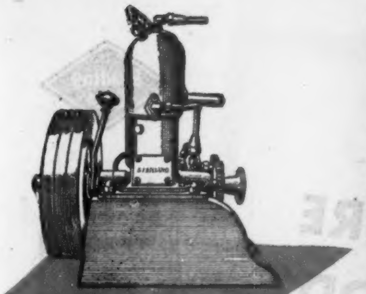
Years of Railway experience and service enables us to cooperate with you intelligently in adapting our dispensers to your postwar car designs. Plan with AJAX Drinking Cups and Dispensers and you will plan with the best.

LOGAN DRINKING CUP CO., Division
68 Prescott Street, Worcester 5, Mass.

PACIFIC COAST ENVELOPE CO., Division
416 Second Street, San Francisco 7, Calif.

Divisions of United States Envelope Company

AJAX *Paper Drinking Cups*



DIESELS *by Sterling*

Nearly half a century of engine building experience — ready for you now!

In the new Sterling Viking Diesel railroad operators are presented with an advanced-design source of power for switchers, passenger or freight motor cars, or for stationary applications. Six and eight cylinder models—supercharged and unsupercharged—from 275 to 650 horsepower—for replacement of present engines or for new installations.

Light weight, unusual compactness, operating economy and job adaptability are Viking Diesel features fully explained in the illustrated engineering data we would like to send you on request. Orders accepted now for early delivery.

★ *Other Sterling engines—gasoline, gas, butane and Diesel, from 85 to 1800 horsepower—are also available.*

"KEEP BUYING WAR BONDS"

STERLING
VIKING DIESEL

STERLING ENGINE COMPANY, 1277 NIAGARA ST., BUFFALO 13, N. Y. *Offices in New York, Washington and Chicago*

Reading Lines

"ONLY ½% REPLACEMENT OF CATENARY CONTACT WIRE OVER A TWELVE YEAR PERIOD"

Reports THE READING COMPANY

100 multiple-unit cars of the type shown above and 20 trailer cars serve the electrified lines of the Reading Company in suburban Philadelphia.

With a twelve year experience record in supplying high-speed electrified rail service to the north and northwest suburbs of Philadelphia, the above evaluation by the Reading Company of the operating economies of Bridgeport's Phono-Electric contact wire is of particular importance to rail executives.

Inaugurated in 1931, the Reading electrified service schedules 281 trains daily over 198 track miles. It has resulted in a patronage increase directly attributable to the speed, cleanliness and frequency of operation which are among the many advantages of electrified rail transportation. There has also been a marked increase in the development of attractive home sites in the territory served.

Outstanding among the performance records of materials used in the READING electrification is that of the Bridgeport Phono-Electric fifty-five per cent bronze contact wire, which, in twelve years of uninterrupted service, has required only ½ of 1% replacement. Furthermore, Bridgeport's nineteen-strand bronze messenger wire is employed in the READING'S all-bronze catenary system. The 80-page, illustrated Phono-Electric booklet, which will be sent on request, details the metallurgical, physical and engineering backgrounds for Phono-Electric's unexcelled performance on electrified lines throughout the country. Send for your copy—today.

PHONO-ELECTRIC *Bronze*

Bridgeport Brass Co.

BRIDGEPORT BRASS COMPANY

. . . another *Oildraulic* IN RAILROAD SERVICE

NEW MAIL FACILITIES ELEVATOR
Illinois Central R. R., Central Station
Chicago

Elevator of 3,000-lb. capacity has a rise of 37 feet serving 4 landings—4 openings. Car size: 5' 9" x 8' 11". Speed: 40 ft. per minute up, 50 ft. per minute down. Push button control.

AN *Oildraulic Elevator* ASSURES BETTER BAGGAGE HANDLING

Rotary's Electric Oildraulic elevators offer advantages unequalled by other types of lifting equipment designed for depot use.

The loads are "pushed up" from below instead of being "pulled up" from above, and this means that new construction costs are much less on this type of elevator because no penthouse or heavy load bearing wall columns are required.

When installed in present buildings, great savings are effected, for all strengthening remodeling is eliminated. We are frequently called upon to replace existing water operated hydraulics that have become worn out or obsolete. In such cases our hydraulic jack can usually be installed in the old outer cylinder which simplifies the installation.

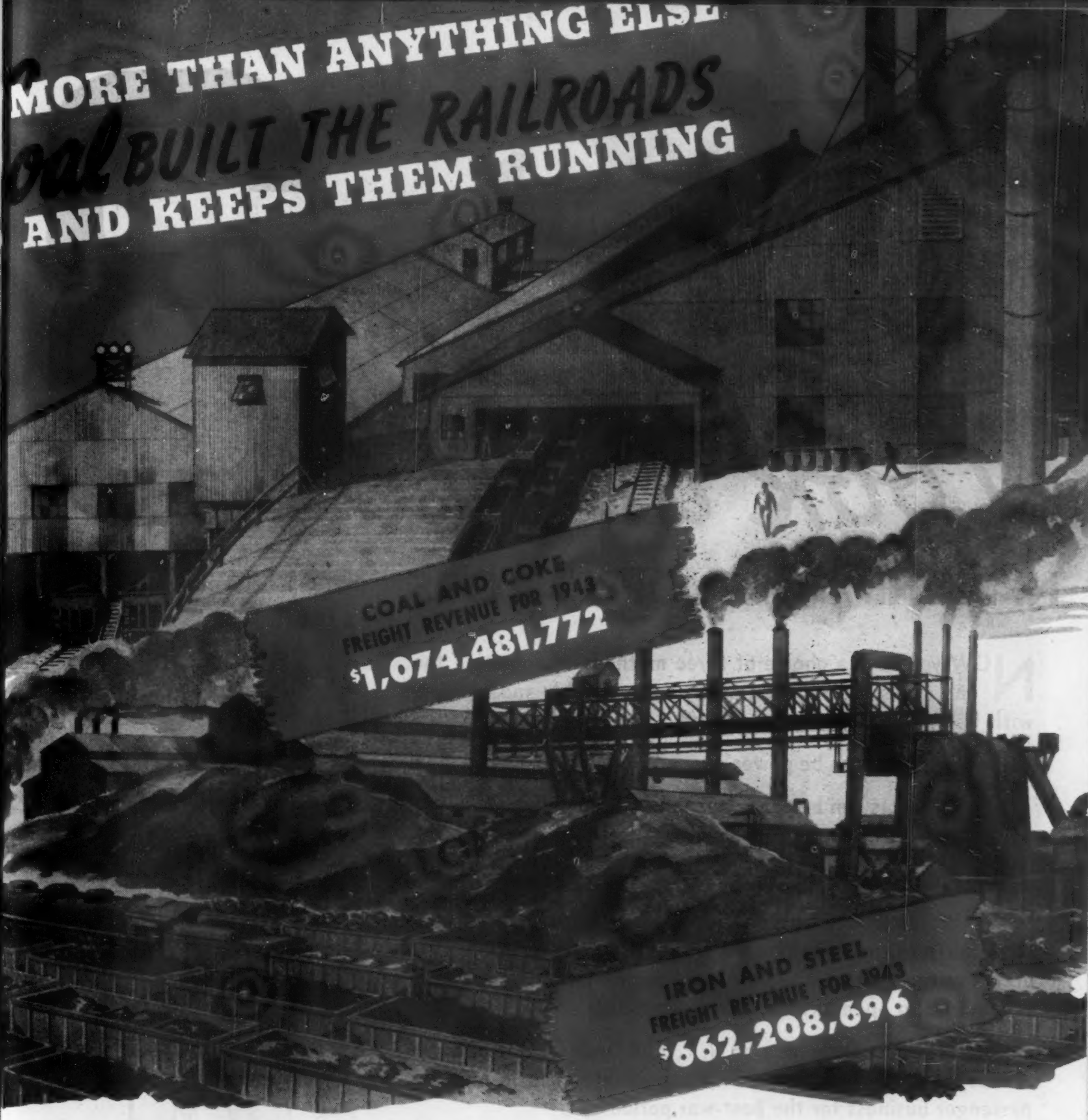
Oildraulic elevators have established an enviable reputation for uninterrupted service at negligible maintenance cost as well as for low per trip operating cost.

SEND FOR OUR ILLUSTRATED ELEVATOR CATALOGUE RE301
IT ILLUSTRATES THE SIMPLICITY OF INSTALLATION AND OPERATION

ROTARY LIFT COMPANY

REPRESENTATIVES IN ALL KEY CITIES, CANADA AND MEXICO

MEMPHIS, 1039 KANSAS TENNESSEE



Pictured at the top is part of the Piney Fork Cleaning Plant of The Jefferson Coal Co. in Jefferson County, Ohio . . . one of eight mines and three mechanical cleaning plants operated by the Hanna Coal Company in Ohio. Coal operations of The M. A. Hanna Company and associates are located also in West Virginia, Pennsylvania, and Kentucky.

IRON and steel make a mighty contribution to the income of American railroads. In 1943 freight revenue from iron ore, pig iron, rails, fastenings, frogs, switches, cast iron pipe and fittings, iron and steel pipe and fittings, nails and wire and all iron and steel rated fifth class and sixth class reached a grand total of $662,208,696. Impressive as this figure is, it was surpassed by bituminous coal alone, which brought a freight income of $906,559,838. Add to this the revenue from anthracite and coke and the coal group freight achieved a 1943 total of $1,074,481,772 . . . Every comparison of freight revenues by commodities, groups or classes emphasizes the overwhelming importance of coal as a source of income to American railroads and as a continuing factor in their success and progress.

THE M-A HANNA CO

The M. A. Hanna Company

★ 1300 LEADER BUILDING • CLEVELAND 14, OHIO ★

USE

VAPO

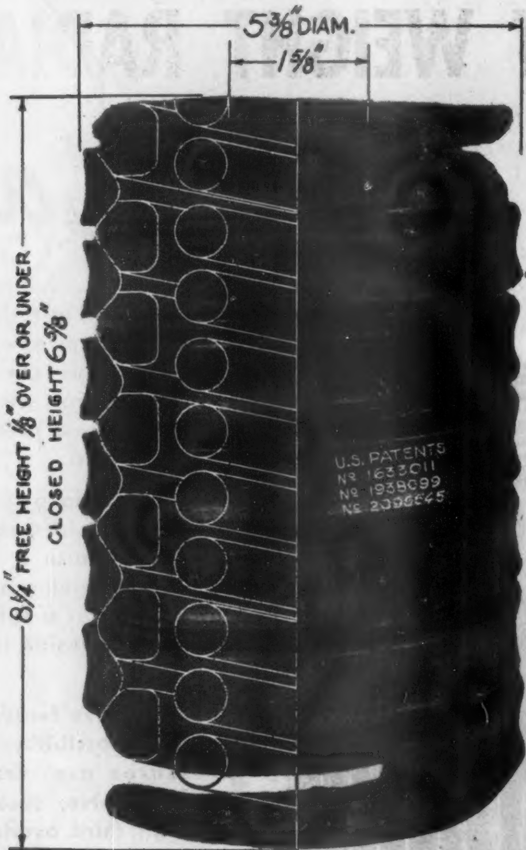
January 6, 1945

YORK
ELPHIA
ICAGO
CE

VAPOR CAR HEATING COMPANY, INC.

Railway Exchange Building, Chicago 90, Illinois

Frost Snubber Springs



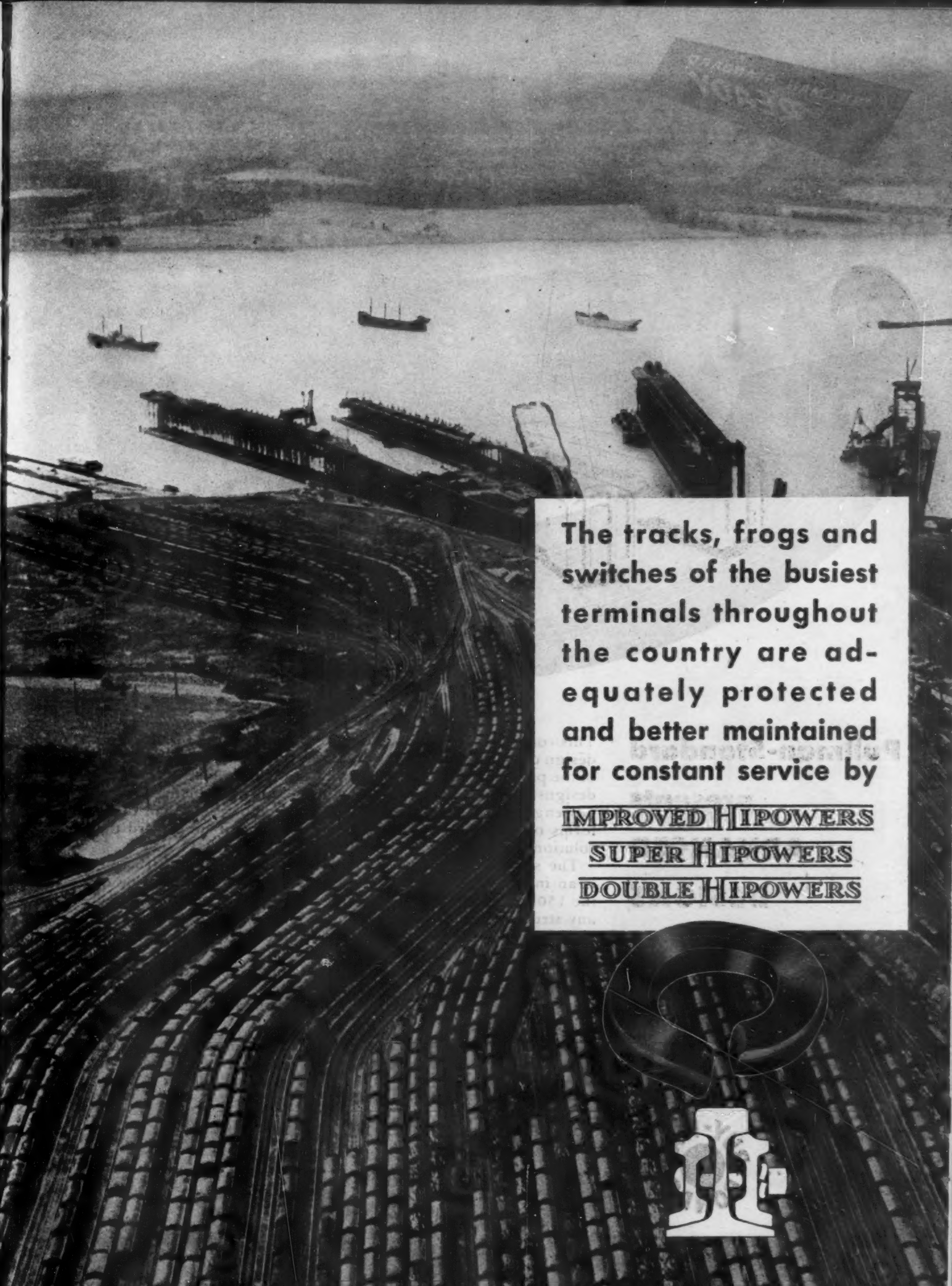
ABSORPTION RESULTS UNDER 27,000 POUND DROP HAMMER AT PURDUE UNIVERSITY OF FROST SNUBBER SPRINGS AFTER BEING UNDER DIFFERENT SERVICES WITH VARYING AGE AND MILEAGE

Kind of Service	Age	Total Mileage Before Testing	Absorption in One Inch Movement Foot Pound	Absorption in Per Cent. 530 Mile Springs Taken as 100 Per Cent
Coal Car	1 Month	530	482	100.0
Refrigerator Car	15 Months	50,000	612	126.0
Gondola Car	7 Years	150,000	326	67.2
Locomotive Tender	28 Months	250,000	308	63.5

It is evident from these results that the Frost Truck Spring No. 360 has a long life and ample capacity for absorbing spring vibration and protecting the car, lading, and track, from excessive dynamic forces.

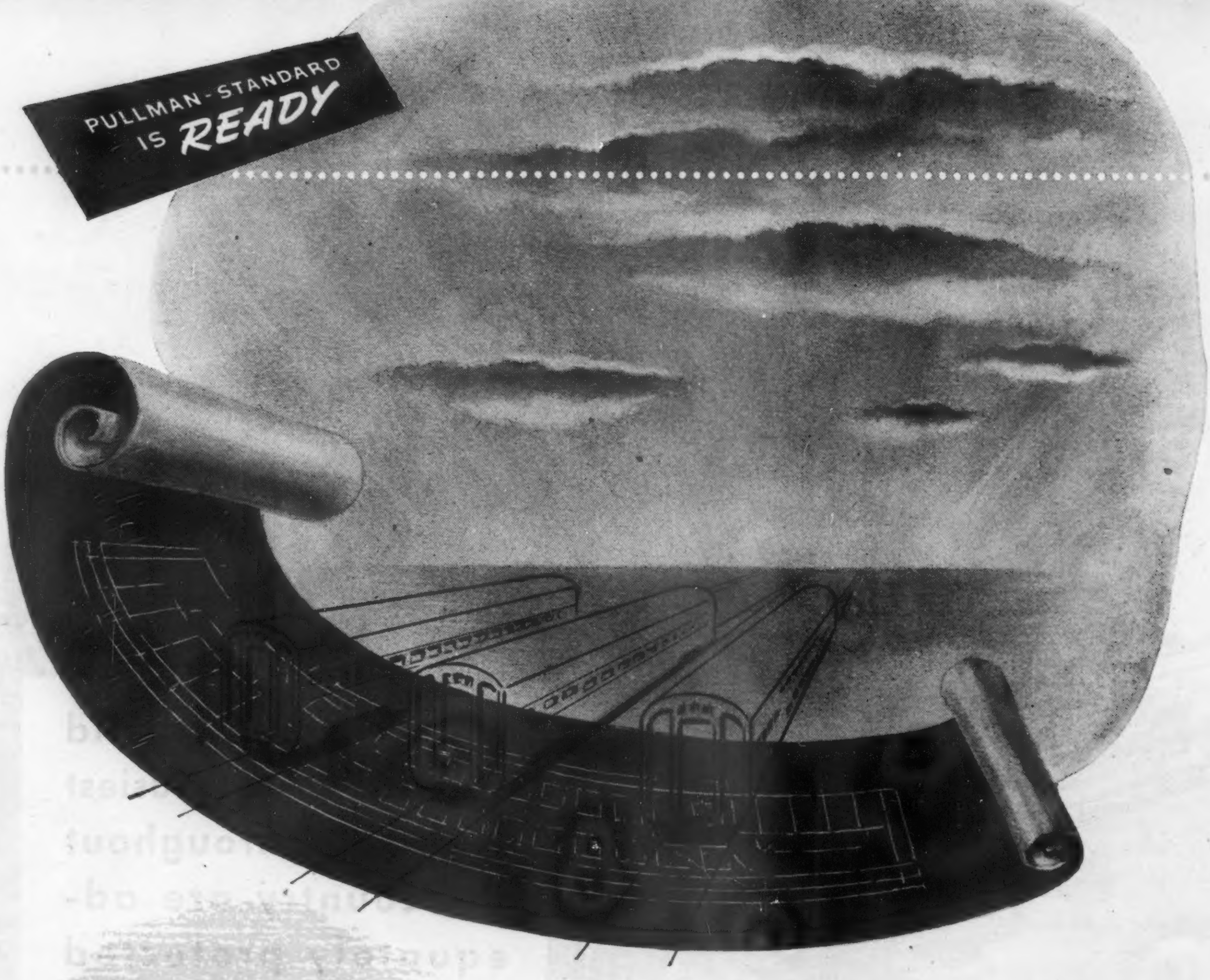
THE FROST RAILWAY SUPPLY CO.

DETROIT, MICH.



THE NATIONAL LOCK WASHER COMPANY, NEWARK, N. J., U. S. A.

A COMPLETE LINE OF RAILWAY SPRING WASHERS



Pullman-Standard presents ADVANCED DESIGNS

This company is prepared to build passenger cars of advanced design embodying many new features which add to the comfort of the passenger and the attractiveness of rail travel. These new designs have been created to help the railroads increase their passenger business in the face of keen competition from other forms of transportation. They also will contribute toward the solution of the post-war employment problem.

The sturdiness of *Pullman-Standard* design and construction is an integral part of all of these new conceptions. Not one of the 1505 light weight cars built by this company has developed any structural weakness requiring reinforcement or rebuilding. All of our designs are thoroughly engineered before being offered to our customers.

Safety, comfort, convenience, attractiveness and economy have been our guides in all of our research work. We are always looking ahead for anything that the future might add to any of these characteristics.

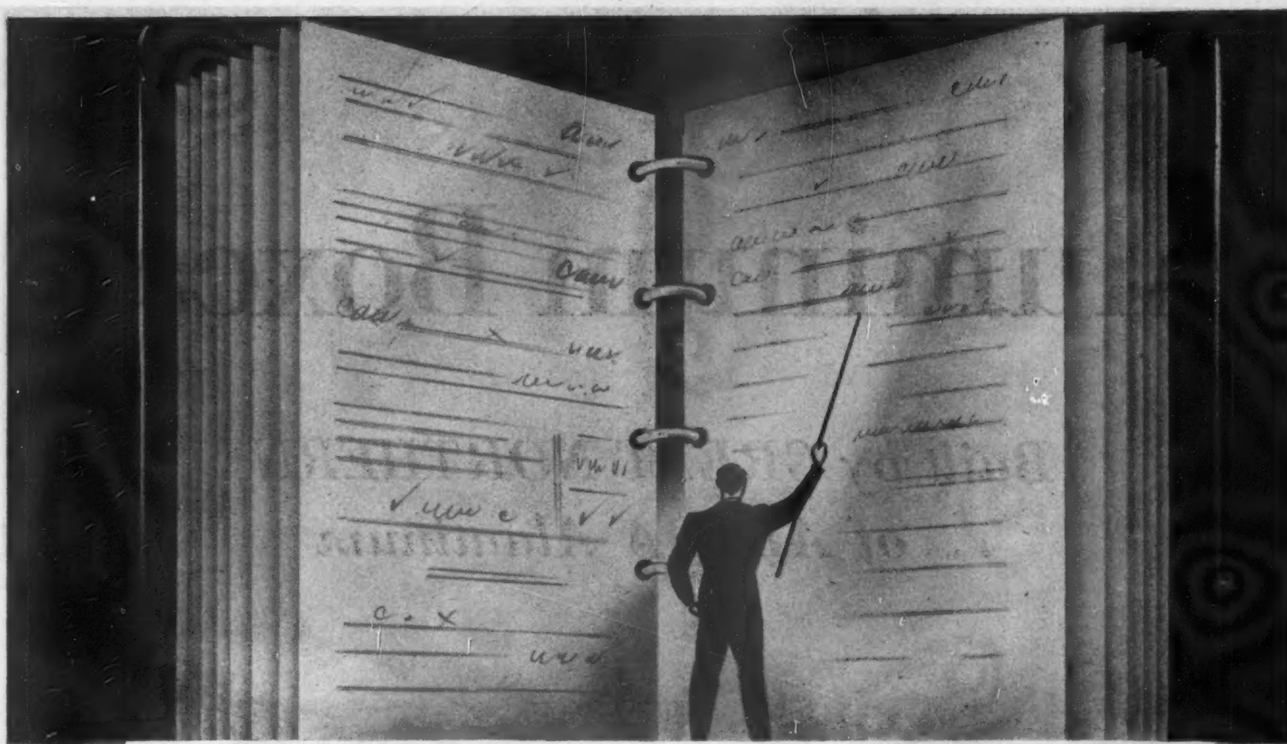
In *Pullman-Standard's* exhibit at Chicago there are numerous plans for passenger cars of different types . . . designs ready to be turned into realities.

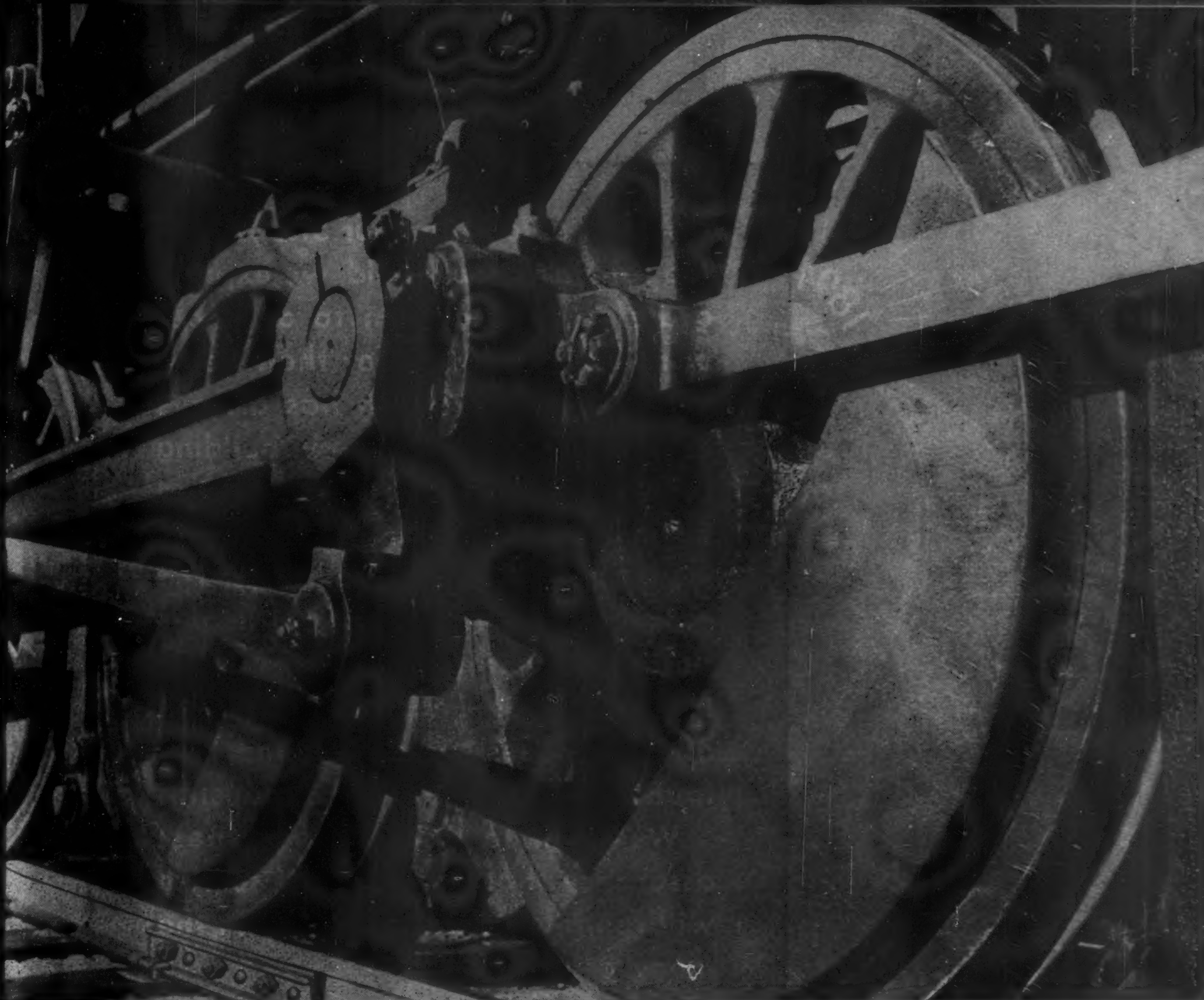
BUY ★ WAR ★ BONDS

Pullman-

CHICAGO • NEW YORK


In the service of . . . A
CHICAGO, ILL.
DETROIT, MICH.
BUFFALO, N. Y.
ST. CHARLES, MO.
BERWICK, PA.
MILTON, PA.
WILMINGTON, DEL.
MADISON, ILL.
ST. LOUIS, MO.
HUNTINGTON, W. VA.





Railway Age

With which are incorporated the Railway Review, the Railroad Gazette and the Railway Age-Gazette. Name registered in U. S. Patent Office.

Vol. 118 | January 6, 1945 | No. 1

PUBLISHED EACH SATURDAY BY THE SIMMONS-BOARDMAN PUBLISHING CORPORATION, 1309 NOBLE STREET, PHILADELPHIA 23, PA., WITH EDITORIAL AND EXECUTIVE OFFICES AT 30 CHURCH STREET, NEW YORK 7, N. Y. AND 105 W. ADAMS STREET, CHICAGO 3, ILL.

WASHINGTON 4, D. C.: 1081 NATIONAL PRESS BUILDING. CLEVELAND 13: TERMINAL TOWER. SEATTLE 1: 1033 HENRY BUILDING. SAN FRANCISCO 4: 300 MONTGOMERY STREET, ROOMS 805-806. LOS ANGELES 14: 530 WEST 6th STREET.

RAILWAY AGE IS A MEMBER OF ASSOCIATED BUSINESS PAPERS (A. B. P.) AND AUDIT BUREAU OF CIRCULATION (A. B. C.).

SUBSCRIPTIONS, INCLUDING 52 REGULAR WEEKLY ISSUES, AND SPECIAL DAILY EDITIONS PUBLISHED FROM TIME TO TIME IN NEW YORK OR IN PLACES OTHER THAN NEW YORK, PAYABLE IN ADVANCE AND POSTAGE FREE. UNITED STATES, U. S. POSSESSIONS AND CANADA: 1 YEAR $6.00; 2 YEARS, $10.00; FOREIGN COUNTRIES, NOT INCLUDING DAILY EDITIONS: 1 YEAR, $8.00; 2 YEARS, $14.00. SINGLE COPIES, 25 CENTS EACH. H. E. McCANDLESS, CIRCULATION MANAGER, 30 CHURCH STREET, NEW YORK 7.

Annual Statistical and Outlook Number

EDITORIAL

RAILWAY OUTLOOK SECTION

GENERAL REVIEW SECTION

STATISTICAL SECTION

GENERAL NEWS

The Railway Age is indexed by the Industrial Arts Index and also by the Engineering Index Service

★

PRINTED IN U. S. A.

The Year at a Glance

PRECOUNTED CHICKENS: Much revision in outlook from that long looked forward to for the beginning of '45 is now required—since the war with Germany, instead of ending in '44 as generally predicted, has become much tougher than at any time for months. The railroads cannot, therefore, now count on the relief that a cessation of European hostilities might bring—while they must continue as expected to handle the domestic transportation end of increasingly heavy pressure on our oriental enemy. The editorial comment in this issue reviews 1944's performance and 1945's prospects in the realistic light of recent military developments. A message from Colonel J. Monroe Johnson, director of O. D. T., on page 5, brings the same viewpoint to bear in assessing 1945's prospective transportation job.

TRAFFIC AND EARNINGS: Freight ton-miles in 1944 were only about 2 per cent above those moved in 1943, and passenger performance registered a gain of about 10 per cent. Detailed accounts of freight and passenger performance appear on pages 15 and 19. The railroads did all this extra work for less net earnings—about $1,095 millions in 1944, as compared to $1,362 millions in 1943 and $1,484 millions in 1942. The carriers do more and more and are paid less and less. As the domestic transportation arm of the war effort, the railroads have, so far, won all the battles to which they have been assigned—but as is indicated editorially herein, they have lost most if not all the battles aimed at safeguarding their own welfare. They lost the battle to restore the Pearl Harbor rate increase. They lost their battle for an end to land-grant rate reductions. Appropriations of fantastic sums for highways and waterways have already been made, with more of the same in the offing. With public opinion more favorable toward the railroads, probably, than ever before, there appears little evidence that this affection is being translated from words and sentiments into deeds. Current dividends average less than 35 per cent of those paid in 1929.

RESEARCH ON HOME STRETCH: The Railroad Committee for the Study of Transportation is undertaking (1) to sound out, itself, all the significant shallows, shoals, reefs and channels likely to interpose themselves athwart the railroads' post-war future and to plot the most felicitous course through these features of the economic topography; and (2) to establish such permanent arrangements as may most effectively continue such informative soundings for future years. The progress of this committee is reported on page 6.

CAN A. & B. BE FINANCED? The opinion is general among those informed of the nation's transportation requirements that the railroads should spend in the neighborhood of $10 billions in the post-war years, in order to bring their plant up to the requirements of industry and the national defense for reliable and efficient transportation service. Can the railroads finance any such improvement program as this? This is a question dealt with in articles on pages 9 and 82 herein. From a survey of current accumulations by the railways of working capital, it is concluded that the railways can *initiate* an improvement program of considerable magnitude—but continuance of the program beyond early post-war years will require much further rehabilitation of railway credit. This, in turn, will call for much more generous dividends to railroad stockholders, and some limitation on the volume of capital the federal government persists in giving away to enlarge and improve the fixed plant of the railways' competitors.

MOTIVE POWER ENIGMA: Wartime conditions have forced the railroads to put all classes of their motive power to a supreme endurance test and, as a consequence, there is more information now available than ever before on which to make a wise choice of the most economical and effective motive power for the future. With such being the condition, our survey on page 12 of the motive power situation concludes that the available information has not been analytically appraised—because, if it had been, the railroads would know what course would prove most satisfactory to them and would now be acting accordingly, with a thoroughness born of conviction.

MATERIAL, SCARCE AND HIGH: Some of the materials needed to keep the railroads running are less scarce than they were—while others are harder to get than ever. Where materials are available in reasonable quantity, a deterrent factor to their purchase on other than a hand-to-mouth basis has arisen in prices, which in some cases are almost one-third higher than in 1940. On the other hand, hesitancy in the face of high prices may lead to still higher costs if the "Little Steel Formula" gives way, as daily evidence accumulates that it may. Our purchases and stores editor assays the over-all materials situation on page 22, and deals with lumber in a separate article on page 25 (suggesting in this connection that some kindred of the fabulous Paul Bunyan, or indeed Mr. Bunyan himself, would come in handy to bring the supply more nearly to equal the demand).

DR. PARMALEE'S REVIEW: The comprehensive outline of all phases of railway operations during the past year—a valued feature of this issue for many years—by the director of the Bureau of Railway Economics appears on page 70. Here will be found closely estimated 12-months figures, the only source of dependable whole-year figures on railway operations available anywhere for many weeks to come.

EQUIPMENT ORDERS: For domestic railroad service, 74 steam and 596 Diesel-electric locomotives were ordered in 1944. Freight car orders totaled 44,825 for domestic railroad service, and passenger car orders totaled 540. Details appear in articles beginning on page 90.

FREIGHT CAR USE: The freight car situation was not only far "tighter" in 1944 than at any time since the war began, but the new installations were not sufficient to begin 1945 with the freight car status as favorable as it was a year ago—if for no other reason than the adding of another year of age to these vehicles. Even a year ago, almost 31 per cent of the total freight car supply was in the 25-years-old-or-older class. These and other significant aspects of the freight equipment condition are discussed on page 34.

"WORK EQUIPMENT": This term, scarcely specific enough for clarity, is used to indicate the means by which maintenance of way and track construction operations are being revolutionized—by being converted from, largely, a manual activity with a spade-full as the predominant unit to a mechanized job where even a cu. yd. at a clip is comparatively small change. There is, probably, no alteration occurring on the railroads more significant than this one, and its 1944 progress and probable future trend are outlined in an article on page 45.

MAKESHIFT SIGNALING: With the war continuing and materials and labor still scarce, available resources have been pretty well taken up with maintaining existing signaling installations—with extensions limited to those promising a definite physical increase in the output of necessary war transportation. The signaling art has now progressed for 15 years during a period when the depression and war in tandem have prevented the railroads from bringing their systems abreast with developments—and many makeshifts have had to be introduced to enable older signaling to meet today's operating requirements with tolerable satisfaction. In an article on page 39 our signaling editor outlines the facts which lead him to the belief that a great lot of signaling installation is in the offing, when the war's end releases the labor and materials. On page 42 he discusses the kindred and highly dynamic developments in the field of train communication.

TRACKAGE: The mileage of new first track constructed in 1944 totaled 121, which was more than has been laid down in any one year since 1937. Abandoned mileage totaled 640, as compared to 1,096 in 1943 and 2,516 in 1942. Details are given in articles on pages 102 and 115.

ARMY RAILROADING: The Army's railroad service had 44,000 officers and enlisted men—and 4,000 locomotives and 60,000 freight cars—in service in theaters of war at the end of 1944, an organization which compares favorably in magnitude with many large domestic railroad systems. An article on page 58 records some of the remarkable accomplishments of these Army railroaders—quite a rejoinder to the song some of the highway zealots were chanting, along with Hitler, back in 1940, to the effect that railroads were no longer needed to fight a modern war.

Railway Results and Prospects

Conditions and prospects in this country at the beginning of the New Year were widely different from what it had been expected for some months that they would be. Everybody had anticipated that the war in Europe would be ended, and that, while the war with Japan would continue, 1945 would be the beginning of transition from a war to a peace economy. The War Production Board had estimated that cessation of the war in Europe would be followed by a reduction of 40 per cent in production for war, which would make possible an almost corresponding increase in construction and production for civilian purposes. The railways were anticipating an increase in the demand for transportation to aid in the war with Japan, but, owing to the defeat of Germany, at least a temporary decline in the total demand.

Nobody ventures to predict the effects of the unexpected successful drive of the Germans on the western front. If it is turned back by the Allies, the war in Europe may end soon. Otherwise, it may be protracted indefinitely. In this period of uncertainty, production for war must be increased, expansion of construction and production for civilian purposes must be deferred, and the railways must meet as large, or perhaps larger, demands of traffic as during the last year.

Traffic and Gross Increase, Net Declines

The war-time increases of both freight and passenger traffic continued in 1944, but at a reduced pace. After increasing during the first half of the year, freight traffic slightly declined during the second half. Consequently, revenue ton-miles of about 740 billion in 1944 handled by Class I railways were only about 2 per cent larger than in 1943. Likewise, passenger traffic, after increasing in the first half of the year, gained but little in the second half, and amounted to about 96 billion passenger-miles, or 10 per cent more than in 1943. Total operating revenues of Class I railways were about $9,482 million, or about $427 million more than in 1943, as compared with an increase in 1943 of $1,600 million. The increase in operating expenses was about $731 million. Because operating expenses increased more than gross earnings, net operating income declined from $1,362 million in 1943 to about $1,095 million in 1944, and net income (after fixed charges) from $874 million to about $696 million. The railways continued to follow a very conservative policy regarding dividends which, as in 1943, amounted to only about $216 million. After dividends in 1943 they carried about $657 million of net to surplus, and in 1944 only about $480 million.

What has occurred on the railways during the war years is well indicated by the graph which accompanies this editorial, and which shows the disposition made of their total receipts in 1929, 1942, 1943 and 1944. "Total receipts" as used in this editorial include total operating revenues plus "other income." As the height of the pillars in the graph indicates, total receipts in 1942, 1943 and 1944 exceeded total receipts in 1929 by the following percentages: 1942, 15 per cent; 1943, 39 per cent; 1944, 46 per cent.

1929 and 1944

The year 1929 was the most prosperous the railways ever have had in peace-time. In spite of increased unit costs of operation and taxes they earned more net in 1942 and 1943 than in 1929. Results in 1944 make a different picture. Total receipts (including "other income") were $3,058 million larger than in 1929. But operating expenses, taxes and rentals took only 75.7 per cent of total receipts in 1929, and took 86.5 per cent of the much larger receipts in 1944. Wages were $1 billion more than in 1929; other operating expenses, almost $900 million more. But the big increase *relatively* was in taxes which took only 6 per cent of total receipts in 1929 and took 18.5 per cent in 1944.

In 1929, in consequence, $1,613 million, or 24.3 per cent of total receipts, was available for return on capital, while in 1944 only $1,310 million, or 13.5 per cent, of the much larger receipts was available for return on capital. Fixed charges in 1929 were $693 million and dividends paid $490 million, a total of $1,183 million. Fixed charges in 1944 were only $614 million and dividends paid only about $216 million, a total of $830 million. Hence out of total receipts $3,058 million larger in 1944 than in 1929, the railways paid owners of their securities 30 per cent, or $353 million, less in 1944 than in 1929. And yet the amount carried to surplus was not much larger in 1944 than in 1929, being $407 million, or 6.1 per cent, of total receipts in 1929, and $480 million, or 5 per cent, of total receipts in 1944.

Battles Won and Lost

The railways in 1944 fought numerous battles to solve the problems of war transportation, and won them all. They lost some important battles in the field of regulation. The Interstate Commerce Commission refused to authorize restoration of an advance of 4.7 per cent in freight rates that was in effect for a period prior to May 15, 1943. This advance, on the basis of

present traffic, would have increased freight earnings about $325 million annually. The decline of net operating income from $1,484 million in 1942 to $1,362 million in 1943 and to about $1,095 million in 1944, due principally to increases in operating expenses, seemed to justify it. Experience in the decade ending with 1930 demonstrated that the railways then needed net operating income averaging $1,000 million a year in order to derive from earnings and the sale of securities enough capital to accomplish adequate expansion and improvement of their properties. They will need more net operating income to accomplish these purposes in the post-war period if construction, production and distribution are large enough to provide as is so often predicted, a national income exceeding $125 billion. The decline of their net operating income to less than $1,100 million in 1944 when their gross earnings of about $9½ billion were the largest in history is not a favorable omen.

Another important battle the railways lost was that for legislation to repeal the provisions under which they have to give the government reduced rates because of the grants of land made to only part of the railways about 70 years ago. The bill for this purpose was passed by the House of Representatives by a large majority. It was confidently predicted by its sponsors that it would be passed by the Senate. But the Senate became more concerned with other matters and the bill died when the Senate adjourned. It will be reintroduced soon after convening of the new Congress.

Purchases—1944 and Post-War

Government restrictions on acquisition of equipment and materials were somewhat relaxed. Consequently, railway purchases from the manufacturing industry probably were the largest last year since 1929. Available incomplete statistics for 1944 compared with similar incomplete statistics for 1943 indicate that purchases from manufacturers increased from $1,115 million in 1943 to $1,300 million in 1944, or 17 per cent. The value of equipment *delivered* by builders in 1943 was $248 million, and the value of equipment *ordered* from them in 1944 was $255 million. Other purchases from manufacturers (including materials acquired by the railways for building equipment in their own shops) were $867 million in 1943 and $1,048 million in 1944.

There is widespread interest in probable post-war railway purchases because of the contributions they will make toward the rehabilitation and improvement of the railways and toward total national employment. Purchases in the post-war period will be determined by what the railways need, and by the resources they have with which to supply their needs. Their needs will be determined by how much obsolescence and deferred maintenance accumulate during the war, and by how much traffic is available after the war. They added about $1,850 million to their surplus in the three years 1942, 1943 and 1944, partly because of government restrictions on their purchases, partly because of a very conservative policy in the payment of dividends. The liquid assets they will have accumulated and net operating income exceeding $1,000 million a year would make possible record purchases for some years. And record purchases will be needed if much longer continuance of the war causes obsolescence and deferred maintenance to continue accumulating.

Resourcefulness and Vitality Shown

It is extremely difficult for anybody who has closely followed developments on the railways for forty years, as has the writer of this editorial, to be pessimistic about their future. In the decade before World War I their traffic expanded so much more than their facilities that they became extremely unpopular, especially because of a resulting bad accident record and chronic shortages of transportation. There was much agitation even from business sources for government ownership. In the midst of World War I government operation actually was adopted, and almost everybody, including railway officers, predicted that it would be permanent. But government operation was so unsuccessful that the few voices raised for its continuance were rendered almost inaudible by the almost unanimous public demand for a return to private operation.

Immediately following return to private operation large advances in wages and rates were made in 1920. Then wholesale prices declined an average of almost 50 per cent within a year, and there occurred the most precipitous decline of construction, production, traffic and railway earnings that ever occurred within an equal period. But after both railway wages and rates had been reduced in 1921 and 1922, and business and traffic recovered in 1923, the railways, in spite of niggardly regulation and rapidly increasing competition from other carriers, enjoyed a period of prosperity lasting seven years. They took full advantage of this period to make the large investments in the expansion and improvement of their properties without which they could not have borne the recent war load. Their accident record became the best of any industry in the world. "Car shortages" were completely eliminated.

Breakdown Confidently Predicted

Then the railways were stricken by the depression. Gross earnings and net operating income declined one-half. Capital expenditures were almost stopped, resulting in a great decline in the amount of equipment available. Maintenance expenditures were cut to the bone—from $2,077 million in 1929 to $921 million in 1933.

The railways had had virtually no opportunity to begin recovering from the depression when they were called upon to meet the demands of a traffic that was enormously increased not only by production for war, but by the diversion to them of both freight and

passenger traffic previously for years handled by coastwise vessels and highway carriers. It was confidently predicted, especially by those who did not wish them well, that they would break down under the load unless they were aided by the government, or government operation was adopted. They were criticized because they responded negatively to a proposal that the government finance the acquisition of some 500,000 freight cars.

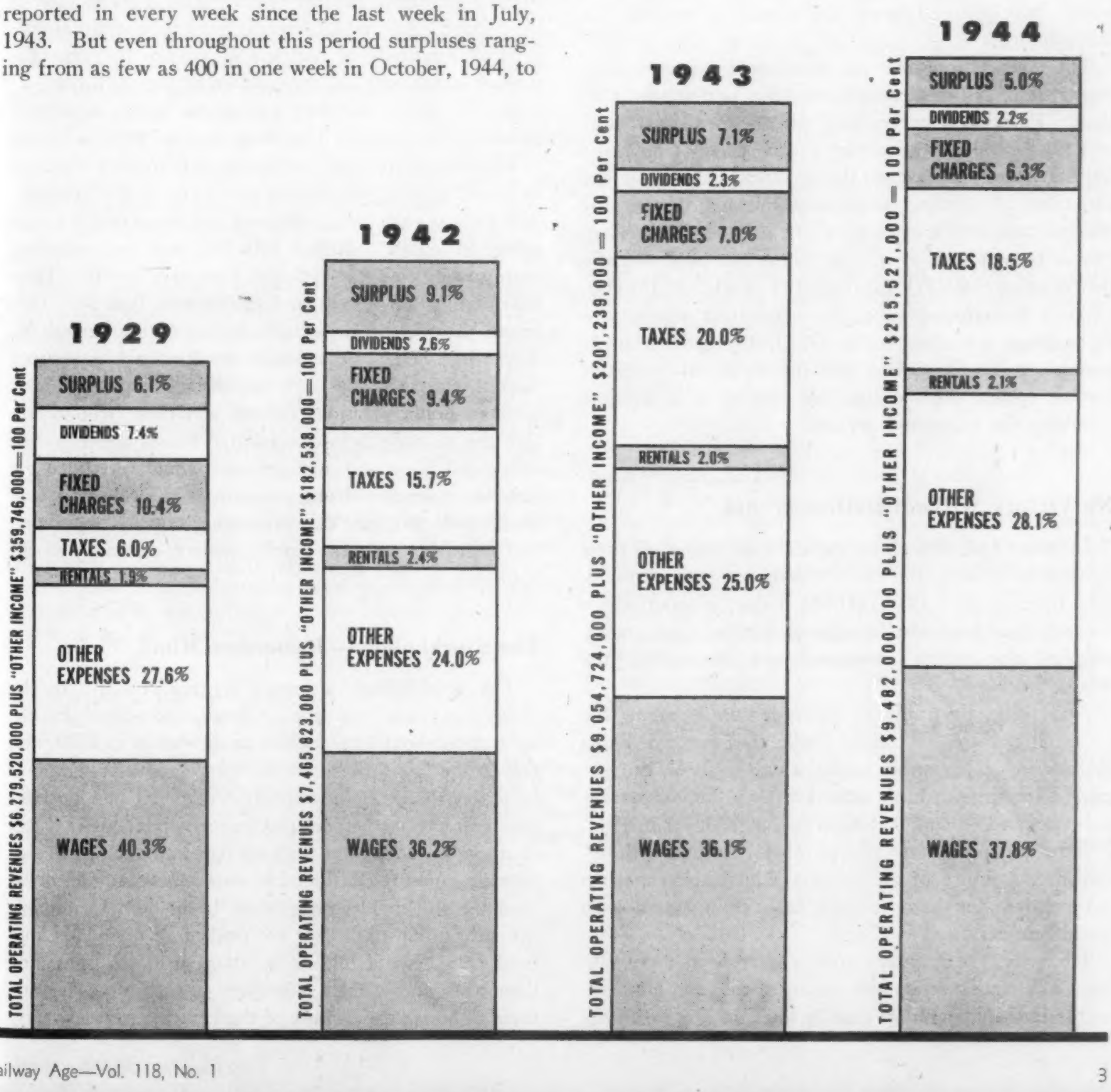
No Shortages Until '43

A transportation "expert" of the War Production Board predicted they would have as early as October, 1941 a shortage of from 80,000 to 130,000 freight cars. But they never had a surplus of less than 40,000 cars in 1941, or of less than 30,000 cars in 1942, and never reported any shortages until in March and April, 1943. Because of the impossibility of perfect distribution of cars and of providing at all times enough of each special type of equipment required, shortages of cars ranging from as few as 257 to as many as 8,000 have been reported in every week since the last week in July, 1943. But even throughout this period surpluses ranging from as few as 400 in one week in October, 1944, to as many as more than 62,000 have been reported, although the freight traffic handled in 1944 was double that handled in 1940.

These results are mainly attributable to skillful operation of the individual railways, to efficient centralized direction of the distribution of cars by the Car Service Division of the A. A. R., and to co-operation of the Shippers Advisory Boards and individual shippers, large and small, throughout the country. They have been due also in part to the acquisition of new equipment and to many improvements made in yards, terminals and signaling; but much larger purchases of equipment and expenditures for other improvements would have been made excepting for government restrictions on materials and man-power.

Magnificent Performance in Oil

Of all the achievements of the railways, perhaps the most remarkable has been the increase in their movement of oil, especially to the eastern seaboard. Virtu-



ally all oil was moved to the eastern seaboard before the war from ports on the Gulf of Mexico in tanker vessels. Crisis has followed crisis in the use, assignment and repair of tank cars since the summer of 1942. Thus far the railroads, in co-operation with the private companies which own the bulk of the cars, have managed to keep the existing fleets in condition to be used.

Tank Cars Deteriorating

The physical condition of tank cars and the repair attention which they required was studied in 1943 by the Mechanical Division of the A. A. R., and its findings showed that, in ten months, there were more than 640,000 tank-car setouts for repairs. The keeping of a national record was discontinued in October, 1943, and there is, therefore, no statistical data available which would indicate the present condition of this equipment. It is obvious, however, as was indicated in our editorial review of the situation in our December 30 issue, that it cannot have improved appreciably in the 14 months which have elapsed since the condition report was discontinued.

The tank-car situation has been acute for more than two years. No new cars have been permitted to be built. Pipe lines, barges and tankers have been built and their supposed advantages were widely publicized but they have not lessened the acuteness of the tank-car situation. According to Colonel Johnson, 15,000 additional tank cars are needed at the present time. They cannot be obtained, so it is up to the railroads to make the existing 140,000 cars do the work of 155,000. Quicker turnarounds and increased train speeds are the answer, according to the O. D. T. Quicker turnarounds mean less time for inspection and repair; greater speeds demand that the cars be in a physical condition for highspeed service.

No Victory Without Railroads' Aid

In spite of all difficulties, the railways increased their movement of oil to the eastern seaboard from virtually zero to more than 1,000,000 bbl. a day, without which it would have been wholly impossible to have adequately supplied the nation's armed forces throughout the world.

And while the railways succeeded in handling the enormously increased freight traffic, they succeeded also in handling a passenger traffic which in 1944 had become four times as large as in 1940—24 billion passenger-miles in 1940 and 96 billion passenger-miles in 1944.

How is it possible to regard otherwise than with optimism the future of an industry which always, when subjected to the hardest tests, has demonstrated such resourcefulness and vitality?

However, the railways always have been more efficient in effecting economies, enlargements and improvements in their operation than in their dealings with the labor unions, and with legislative and other government agencies, the results of which so largely determine their net earnings.

Faith Without Works

As emphasized by Charles H. Woods, general solicitor of the Santa Fe, in a recent address to the Minneapolis Traffic Club (*Railway Age,* December 16, page 922), public sentiment is more favorable toward the railways now than ever before, largely because of their achievements during the war, and yet they continue to lose one important battle after another involving their competition with other carriers and their wages and rates. Only a little over a year ago the labor unions got advances in wages 40 per cent larger than were recommended by the fact-finding boards appointed by the President. Recently the Interstate Commerce Commission refused to authorize an advance of less than 5 per cent in freight rates than seemed obviously justifiable. The bill to abolish the reductions in rates made to the government because of ancient land grants [illegible] in the Senate. And now Congress has begun again appropriating hundreds of millions of dollars the expenditure of which will aid competitors of the railways.

The trouble is not that a favorable public sentiment has not been created. The trouble is that there is failure to so activate this public sentiment as to make it effective in behalf of fair government treatment of the railways. The railways are better officered and organized for carrying on public relations activities and are spending more money on these activities than ever before. They have numerous officers and committees that ably represent them before legislative bodies and commissions. This paper believes that better results could be secured if, first, closer liaison were established by management between public relations officers and those who represent the railways before legislative bodies and commissions, and if, second, management would recognize the fact that it needs a strong pressure group to back it, and would seek to create this pressure group by organizing and activating railway security owners, especially stockholders.

The Stockholder — Remember Him?

The stockholder, although its real owner, is the "forgotten man" of the railroad industry. Stockholders received $490 million in dividends in 1929, and during the last three years have received an average of only about $200 million in dividends. Sooner or later they will have to be paid much more dividends if prices of stocks are to become high enough to make practicable financing on any considerable scale by the sale of stock. And the stockholders can never be made a formidable pressure group until they are paid more dividends, and until management takes the initiative in so organizing them as to enable them effectively to assert and demand their rights as the owners of the railways.

TOUGHEST YEAR *ahead*

Felicitations for a well done job but concern for its mounting difficulties is message from O. D. T.'s chief

By COLONEL J. MONROE JOHNSON

THE year just ended has witnessed outstanding advances in the progress of the war both in the European and Pacific theatres. It goes without saying that those advances would not have been possible had there not been a well-functioning program of emergency transportation here in the United States, by which the vital needs of armies and navies could be supplied.

A YEAR ago we thought American transportation had just about reached the limits of what it could do. Yet, what has been accomplished in 1944 shows that such a belief underestimated our capacity for handling troops, war supplies and civilian needs when all transportation—railways, waterways, highways, airlines, pipelines—join with their government in doing a job.

To that achievement of 1944 I should like to pay tribute; to the railroad men who had so important a part in it, I offer my felicitations. A great job magnificently done! It is not necessary to present a lot of statistics in order to convince you. The readers of the *Railway Age* know the figures, and we of O. D. T. know them!

BUT if I were to stop there—with a mere congratulatory gesture—I would have left unsaid something which I feel cannot be stated too often or too emphatically: The job is not yet finished! Indeed, to all appearances the demands upon the nation's transportation lines, preeminently upon the railroads, are going to be heavier in 1945 than in 1944. A few months ago we heard large talk on all sides of the quick end of the German war. As a result, there was—whether we were conscious of it or not—an appreciable let-up in many sectors of our effort. (I speak not only of transportation people, of course, but of all who are engaged in war work). We know now that such easing up, such relaxation, often has repercussions in the front lines, when word comes back to us that our men have not sufficient ammunition or other equipment to do the vital work at hand.

FREQUENTLY I receive requests to address business, professional or civic groups on the subject of some phase of post-war planning. Frankly, I cannot think of anything to say on such a subject. While there are still two wars to be won, while there yet come to us calls from the front that more and more troops, more and more supplies are needed, there is only *one* kind of planning in which I feel free to engage. And that is, how to bring victory at the earliest possible moment and thus prevent the further loss of lives and treasure.

To railroad men I can say only that the job ahead for the coming year will, I honestly believe, exceed our 1944 record. With little or no increase in equipment and with a steadily diminishing man-power supply, the railroads must assume longer and heavier hauls that will involve the further cutting of corners, taking in the belt another notch or two, making one piece of equipment do the work of two or three in normal times.

Now that the Pacific war has entered its vital stage, with an added intensification of the European conflict, we face the task of keeping on with our movement of supplies from points of production and manufacture to the Atlantic seaboard, and in addition moving other and great loads clear to the Pacific coast. You well know what that means—200- or a 300-mile haul on the one hand, or a 3,000-mile haul on the other.

MORE, too, there are no pipelines or waterways running from our interior to the Pacific coast which, as faithful auxiliaries to the railroads, can carry vital loads of petroleum and its many needed products. Also such long runs as those to the West coast, are too great for motor tank trucks to be of any material service, even without the tire shortage which continues critical with no prospect of immediate improvement.

True, there is an undisclosed number of tankers carrying petroleum and its products through the Panama canal, to the Pacific war zone, but for the all important overland haul, the railroad tank cars (about whose scarcity you railroad men know considerable) must do the whole job, in order that a constant flow of liquid fuel for our war machines be kept moving to ship-side on the West coast.

IN the passenger field, the grim fact faces us that we must expect, in 1945, increased casualty loads for passenger trains. Thousands of such casualties will have to be moved each month—casualties with their attendants, and in increasing numbers. That, of course, means that even though civilian travelers must sacrifice space holding, the railroads must see that the ill and wounded service men get through. Other military movements as well as essential civilian travel will continue to be large.

As for specific suggestions: Such matters as cutting down turn-around time to the irreducable minimum; working labor forces twenty-four hours a day, seven days a week; speeding up, by voluntary effort, loading unloading of freight cars and thus avoid embargoes and penalty demurrage charges—these are problems which are common to all railroads and which represent most of the bottlenecks. May I commend them to your still further consideration? Anything that can be done to promote our war transportation efficiency enhances the supply of material reaching our armed forces and thus brings victory closer.

LET us then make this firm resolve for the new year: "transportation will continue its part of the job to bringing certain defeat to the enemies of our nation."

PLANNING

program now on home stretch

Railroad Committee for the Study of Transportation has issued 16 reports, and expects to complete its studies this year – Effective follow-through seen in A. A. R. action creating research department headed by Judge Fletcher

Creation of the Association of American Railroads' new Department of Research, headed by Judge R. V. Fletcher as vice-president—research, reflects the railroad industry's determination to keep its eye on the ball in the post-war period.

The way has thus been paved for an effective follow-through from reports and recommendations coming from the Railroad Committee for the Study of Transportation, which has been functioning for two and one-half years under Judge Fletcher's chairmanship.

One of the new department's first assignments is to see that the study committee carries on without change of set-up or procedures, and that its pending studies are completed according to the original plan.

Sixteen reports have now been issued by eight of the fifteen subcommittees. They deal with labor and personnel problems, post-war prospects for cotton tonnage, air transport, pipe line transport, public relations, engineering and mechanical research, federal taxes, and accounting methods and procedures—all pointing the way to better railroading or making sound recommendations on matters which affect railroading.

Other investigations are well on the way to completion, including some 40 commodity studies, and traffic surveys out of which will come recommended policies for building railroad business.

The line-up herein of the published studies and the work-in-process is convincing evidence that the industry should be on top of the situation when it comes to knowing about the best way to do things in the post-war era.

R. V. Fletcher
Vice-President—Research—A. A. R.

By *WALTER J. TAFT*
Washington Editor

REFLECTING again their determination to keep an eye on the ball in the post-war period, leaders of the railroad industry, during the past year, paved the way for an effective follow-through from the reports and recommendations which have been coming from the Railroad Committee for the Study of Transportation. The board of directors of the Association of American Railroads, which set up this research group two and one-half years ago under the chairmanship of A. A. R. Vice-President R. V. Fletcher, has recently created a Department of Research within the Association.

Sixteen Reports Published

It, too, is headed by Judge Fletcher, who has been elected vice-president—research, and relieved of all A. A. R. legal work except that in connection with the federal government's anti-trust complaint against the railroads. Meanwhile, the work of the study committee, with which Judge Fletcher remains as general chairman, is continuing without change of set-up or procedures, one of the new department's first assignments being to see that the pending studies are completed according to the original plan.

The committee's program is now entering the home

stretch, with 16 reports published and many others well along. At the year end it looked as though the whole job would be completed in another 12 months. The *Railway Age's* latest general review of the committee's work appeared in the issue of May 20, 1944, page 950. As explained there, the whole study group consists of the general committee and 15 sub-committees with a total membership of more than 100 drawn from all departments and branches of the railroad industry. The comprehensive program of studies is designed to produce realistic and practical reports which will point the way to future progress in all phases of railroading, and inform railroad men of developments and trends which may affect railroading.

Several additional reports of subcommittees have been published within the past six months, among them the report on "Raw Cotton and Cotton Linters," issued by the Subcommittee for Economic Study. This report, reviewed in the *Railway Age* of December 16, 1944, page 934, is the first of some 40 commodity studies expected to come from that subcommittee which has been called one of the most important of the fifteen. It has for its chairman J. V. B. Duer, assistant to vice-president, Pennsylvania, and it has engaged the full-time services of Loyd J. Kiernan, former railroad statistician of the Equitable Life Assurance Society and prior to that a member of the Illinois Central's traffic department staff. Its function is to ascertain, as accurately as possible, the economic conditions that will prevail in the United States in the post-war period.

This assignment has been divided by the subcommittee into two branches—one under the supervision of Dr. Julius H. Parmelee, director of the Bureau of Railway Economics, is engaged in the preparation of statistical material relating to all factors that should affect the commercial life of the nation. Among such factors are population, employment, scales of wages, national income, production, distribution of wealth, etc. The subcommittee believes that these tables will present information which has never before been collected and made available to the public.

The Commodity Studies

The commodity studies comprise the other branch of the subcommittee's work, and Dr. Parmelee and Mr. Kiernan have devoted a great deal of attention to them. Nine commodity groups have been organized, each under the direction of a leader, and offices have been established at New York, Chicago, Philadelphia, Pa., Washington, D. C., and Detroit, Mich. The "Raw Cotton and Cotton Linters" report came from Group 8, which is dealing with textiles under the supervision of W. L. Taylor, assistant to freight traffic manager, Southern. It followed the pattern to which all of the commodity studies are expected generally to conform, the purpose being to present definite ideas as to the production of the commodities involved, how and where they will be distributed, and the agencies of transportation which will be employed in their distribution. They will not deal with rates or traffic policies, consideration of those matters being the function of the Subcommittee on Traffic.

After releasing the cotton report, the general committee still had in hand three other commodity studies which it has approved—those on corn, iron ore, and motor vehicles. Awaiting general-committee approval are the final subcommittee drafts of the reports on fertilizer, natural gas, salt, naval stores, wool and mohair, and fluxing and refractory materials in the iron and steel industry. Remaining reports will deal, among other commodities, with pulpwood, timber supplies, agricultural implements, fuel in the iron and steel industry, hogs, cattle, hydro-electric power, paper and pulp, sugar, wheat, anthracite coal, iron and steel scrap, fruits and vegetables, animals and their products, textiles, and oats.

The Subcommittee on Engineering and Mechanical Research, headed by A. E. Perlman, chief engineer of the Denver & Rio Grande Western, enjoys the distinction of having had one of its recommendations result in the creation of the A. A. R.'s new Department of Research. In its initial report, made over a year ago, this subcommittee recommended the establishment of a department of technical research under a director. Acting upon this recommendation, the A. A. R. board of directors authorized the employment of Clyde Williams, director of the Battelle Memorial Institute, Columbus, Ohio, as a technical consultant on research matters. The creation of the Department of Research followed upon the board's consideration of Dr. Williams' report.

Plans for More Technical Research

In addition to continuing the work of the study committee, as noted above, the new department will also arrange for continuance of technical research work which Dr. Williams had got under way. In this connection, plans call for the employment of a director of technical research, who is expected to concern himself largely with fundamental or basic research, as distinguished from current research work. Thus it has been emphasized that his work will in no way interfere with existing A. A. R. research programs, such, for example, as those of the Engineering and Mechanical divisions.

The most active report publisher thus far has been the Subcommittee on Labor and Personnel. It has issued nine reports, starting the series more than a year ago with the "Partial and Progress Report on Railroad Personnel Problems," which was reviewed in the *Railway Age* of November 27, 1943, page 871; and coming through most recently with the three reports on centralized hiring, employee suggestion systems, and rest room facilities, which were reviewed in the issue of December 9, 1944, page 893. In between came reports on public relations training for railroad employees, credit unions in the railway industry, recreational programs, group insurance, and the timely report on "Reemployment of Ex-Service Men and Women," which was reviewed in the *Railway Age* of October 7, 1944, page 552.

These labor-and-personnel reports "contain a number of valuable suggestions in the interest of the welfare of employees and the improvement of relations as between employer and employee," according to one authoritative appraisal of the subcommittee's work to date. L. W. Horning, vice-president—personnel, New York Central, is the chairman.

Air Transport and Taxation Studies

Two subcommittees completed their work with the publication of their final reports during the past year. They were the Subcommittee on Public Relations, of which Robert S. Henry, assistant to president, A. A. R., was chairman; and the Subcommittee on Pipe Line Transport, which was headed by W. G. Vollmer, senior vice-president, Missouri Pacific. The former's "Public Relations in the Railroad Industry—Principles, Organization and Program" was issued early last year and reviewed in the *Railway Age* of February 12, 1944, page 362. The pipe line report, a comprehensive study of more than 250 pages, was reviewed in the issue of September 2, 1944, page 381.

The Subcommittee on Air Transport, headed by L. F. Whittemore, assistant to president, Boston & Maine, has issued its "Initial Study of Air Transportation." As noted in the *Railway Age* of April 1, 1944, page 641, this report avoided all controversial subjects, confining itself to a factual survey of conditions under which domestic airline operations have been conducted and are likely to be conducted in the foreseeable post-war period. The subcommittee has in preparation further reports which will go into other phases of air transportation, including subsidies to air carriers.

From the Subcommittee on Taxation has come the report entitled "Some Recommendations for a National Postwar Fiscal Policy," which was reviewed in the *Railway Age* of June 3, 1944, page 1063. It deals with federal taxation; while another report, the work on which is far advanced, will deal with state and local taxes. Meanwhile, the report on federal taxes has been distributed widely, copies also going recently to a subcommittee of the House committee on ways and means which had asked for recommendations from the railroad industry. Karl W. Fischer, assistant to president, Chicago, Burlington & Quincy, is chairman of the Subcommittee on Taxation.

Since the submission of its progress report in mid-1943, the Subcommittee on Accounting and Statistics, headed by G. T. Carmichael, vice-president and comptroller, New York, New Haven & Hartford, has been pursuing other studies on which reports are expected in the near future. Generally, the progress report records recent progress on accounting and statistical methods and outlines desirable objectives which might be achieved through research into other similar matters. Meanwhile, this subcommittee's Statistical Division, headed by J. P. McDonald, general statistician, Atchison, Topeka & Santa Fe, has been working on possible reports having to do with cost accounting and matters of that kind—one of the most difficult questions which confronts the railroad industry in connection with competitive rate adjustments.

Consolidation and Highway Reports About Ready

The seven remaining subcommittees had not published results of any of their studies when this article was written; although it was expected that final reports of the Subcommittee on Consolidations and the Subcommittee on Motor Transport would be made public shortly. Persons who had seen late drafts of the former expressed the belief that it will become "the most complete historical statement on the subject of railroad consolidations that has ever been issued." C. E. Smith, vice-president, New York, New Haven & Hartford, is chairman of the Subcommittee on Consolidations.

The Subcommittee on Motor Transport, of which H. R. Lake, general manager, Department of Highway Motor Transport, A. T. & S. F., is chairman has undertaken a comprehensive study of highway transport in all its phases; and its forthcoming final report is expected to include the substance of three tentative reports on trucks, buses, and private automobiles, which have been circulated among members of the general committee. These reports trace the history of motor transport, study the functions which highway vehicles perform, and deal with costs and the type of traffic which is now being handled and which will probably continue to be handled. The final report is expected to deal also with labor conditions and every other feature necessary for a thorough understanding of the place of motor transport in a completed, coordinated transportation system.

In like fashion has the Subcommittee on Water Transport undertaken comprehensive studies of the history and development of water transportation on the Mississippi River, the New York Barge Canal, the Columbia River, the Great Lakes, and the Atlantic, both intracoastal and intercoastal. This subcommittee is headed by E. A. Smith, senior general attorney, Illinois Central, and experts have been employed to assist in the preparation of the reports, which are far advanced.

The Subcommittee on Operating Methods and Procedures, headed by J. M. Symes, vice-president of the Pennsylvania, has thus far deferred the making of any reports because it must necessarily base many of its conclusions upon recommendations made by other subcommittees. Meanwhile it has engaged the services of technical experts who are considering such matters as coordination of facilities, deferred maintenance, equipment needs, cost of producing transportation in the post-war period, competitive wastes, certain aspects of the labor problem, and burdensome costs as a result of action of public authority. This list is by no means all-inclusive, for other topics are under consideration.

Big Job for Traffic Subcommittee

The function of the Subcommittee on Traffic, of which F. J. Wall, vice-president, N. Y., N. H. & H., is chairman, is to take the various reports of the Subcommittee for Economic Study as to the outlook for total traffic available for transportation, the reports of the subcommittees on Motor, Water, Air, and Pipe Line transport as to the outlook for competition for that available traffic, to make such other studies as may be necessary, and then, in the light of these facts, to consider prospective traffic policies for improving rail business in the post-war period.

The subcommittee has established headquarters at New York and completed the formation of an organization. And the foregoing program is well under way. Twenty-five carload committees, composed of railroad traffic officers from each of the major territories, are working on carload traffic. Each of these 25 committees has been assigned a commodity group of allied commodities which are important to the railroads. Organized along similar lines are committees working on merchandise traffic, and on freight sales and development. The passenger phase of the subcommittee's work is being carried on under the direction of F. H. Baird, general passenger traffic manager, N. Y. C.

"Railroads in This Century"

The Subcommittee on Finance will deal with financial problems which confront the railroads. Its chairman is R. E. Connolly, vice-president, I. C., and its studies and report will depend upon developments as they occur. Judge Fletcher is chairman of the Subcommittee on Legislation, which will probably defer the making of any reports until the work of other subcommittees has progressed further.

When all subcommittee reports are in there will remain the job of embodying their salient features into a single volume, a work which it is hoped can be undertaken actively during the early part of this year.

Meanwhile, the general committee has sponsored the distribution of "Railroads in This Century," which is an attractive summary of facts and figures dealing with railroad history and development, amply illustrated with numerous charts. The pamphlet was issued under the direction of R. J. Littlefield, superintendent of motor service, P. R. R., and 30,000 copies have been distributed.

whence MONEY *for improvements?*

Accumulation of quick assets can initiate a large program but, to sustain it, carriers' credit must be further restored

By *J. G. LYNE*
Assistant to Editor

IN December, 1944, the editors of *Railway Age* and other Simmons-Boardman railway publications issued a pamphlet entitled "The Post-War Railway Market for Manufacturers" in which the prediction was made that the railways' annual buying (excluding fuel) in the immediate post-war years would exceed that of 1941, when purchases by the railways were slightly more than $1.2 billions. This forecast was based upon the assumption that national income and production, in the years right after the cessation of hostilities, would approximate the goal of $140 billions (of "gross national product" in terms of 1940 dollars) established by the Committee for Economic Development.

Grounds for Hope

If the goals of national production set by the Committee for Economic Development, or the President's campaign promise of "60,000,000 jobs" are attained, there will be a lot more traffic for the railroads to move than they handled in 1941, when they earned $1 billion of net railway operating income.

Costs, wages, and taxes have risen and rates have not—but the I. C. C. has not foreclosed a rate increase if net operating income should decline dangerously. Never generous to the railroads, the Commission in times past has allowed them rates to permit moderate earnings in times of brisk traffic.

Assuming a high level of national production—which appears to be assured by political means so long as the national credit holds out, even if free enterprise is denied the opportunity to perform this function—it appears that railroad traffic should surpass the 1941 level, and that regulatory precedent will support rates to attain net operating income at something like that of 1941.

Such earnings, with the war's backlog of buying power, would indicate capital and maintenance purchases, for a while, at the high level of the late '20's. The question is whether railroad credit will be sufficiently restored to sustain this improvement program once it is started.

Some have questioned the attainability of a peace-time national production at the goal set by the Committee for Economic Development—but it will be recalled that the President in the recent political campaign promised the electorate "60 million jobs." It appears likely, therefore, if employment and production fall very short of the goal the Committee on Economic Development has set, that private employment will be augmented by a large program of "public works" and other coerced capital expenditures, so long as the federal government's credit holds out. Activity in the capital goods industries to attain either $140 billions of "gross national product" (in terms of the 1940 value of the dollar) or to fulfill the President's promise of "60,000,000 jobs" would provide traffic and gross revenues for the railroads substantially in excess of those of 1941.

It is true that the railways' operating costs and taxes have greatly increased, and that the carriers have to rely on the mercy of the Interstate Commerce Commission for a rate level sufficient to leave a margin for net earnings above their operating expenses. The I. C. C. is never generous in this respect, but, on the other hand, it has seldom failed to permit the railroads a rate level which would allow them moderate net earnings in times when traffic was heavy. In the recent freight rate-increase case before the Commission, it is significant that the suspended increases, while not restored by the I. C. C., were not cancelled either. Instead, their suspension was continued for another year—suggesting a willingness on the part of the regulators to grant a restoration of these increases whenever the railroads' need for them is beyond dispute.

High Production Will Mean Heavy Traffic

The goal of national production aimed at by the Committee for Economic Development in the post-war years is almost 25 per cent above that of 1941, in which year the railroads earned $1 billion of net railway operating income. Thus, it does not appear unreasonable to assume that the railroads should earn at least as much net railway operating income in the immediate post-war

Table I—Selected Balance Sheet Items, Class I Line-Haul Railways

Year	Cash and Temporary Cash Investments (000)	Total Current Assets (000)	Total Current Liabilities (000)	Excess of Current Assets over Current Liabilities (000)	Total Long-Term Debt (000)	Total Corporate Surplus (000)
1929*	$677,955	$1,717,953	$1,200,984	$516,969	$11,138,121	$5,029,171
1930*	592,071	1,510,975	1,162,170	348,805	11,174,816	4,577,730
1931	419,510	1,213,350	1,147,239	66,111	11,153,678	4,395,508
1932	379,136	1,063,271	1,130,731	– 67,460	11,247,777	4,094,531
1933	394,117	1,034,560	1,261,382	– 226,822	11,112,055	3,900,883
1934	380,212	1,058,326	1,471,321	– 412,995	11,041,472	3,714,302
1935	439,403	1,086,467	1,670,767	– 584,300	10,821,788	3,507,220
1936	578,343	1,292,421	1,885,574	– 593,153	10,452,266	3,349,889
1937	392,486	1,143,990	1,937,830	– 793,840	10,686,814	3,126,391
1938	480,550	1,120,968	2,243,961	–1,122,993	10,558,723	2,739,742
1939	578,359	1,292,705	2,555,903	–1,263,198	10,352,646	2,563,879
1940	680,400	1,442,142	697,200†	744,942	11,288,311†	2,474,249
1941	904,600	1,914,544	1,115,320‡	799,224	11,186,063	2,666,625
1942	1,736,933	3,065,093	1,806,030	1,259,063	10,879,476	3,167,986
1943	2,807,275	4,497,065	2,923,078	1,573,987	10,462,770	3,748,508
1944	2,890,319	4,574,945	2,852,186	1,722,759	*(1944 totals are Sept. 30)*	

* Switching & Terminal Companies Included.
† In 1940 and thereafter long-term debt in default is included in long-term debt. In years prior thereto it is included in current liabilities. Likewise in 1940 and thereafter default interest is removed from current liabilities to deferred liabilities.
‡ Tax liability included in 1941 and thereafter.

years as they earned in 1941, even though their operating costs and taxes are greater—since larger gross and, possibly, higher rates should offset their increased expenses.

Cash to Start the Ball Rolling

Net railway operating income is the principal factor governing the magnitude of railway purchases. Purchases usually considerably exceed net railway operating income (as, for example, in 1941, when one billion in net operating income resulted in more than 1.2 billions of purchases from manufacturers). This normal relationship has not obtained, however, during the war years—because of the scarcity of labor and the impossibility of obtaining materials for projects other than those immediately necessary for the physical handling of war traffic. The railroads' war-time inability to spend in amounts commensurate with their net earnings has led to an accumulation of cash. In an article surveying the carriers' likely contribution to post-war production and employment in our Annual Review and Outlook Issue at the beginning of 1944, page 9, attention was called to the fact that this accumulation of cash—even when accrued tax liabilities were deducted—exceeded one billion dollars. This accumulation, in excess of tax liabilities, has continued in 1944 and, at the end of September was almost 1.1 billions.

At the war's end, therefore, the railroads give promise of having a substantial store of cash with which to initiate on a large scale, expenditures with manufacturers and, for reasons set forth in the foregoing, it is believed that immediate traffic prospects should provide them both with the funds and the incentive to maintain such expenditures at a substantial level, for a few years anyhow. During 1944, moreover, the railways continued to retire their bonded indebtedness from earnings (except for which their accumulation of cash would have been even larger than it was). This practice, of course, by reducing fixed charges, will have the effect in the post-war years of converting a larger proportion of gross into net; and, hence, will tend to increase the ratio of spending power developed from a given volume of gross revenue.

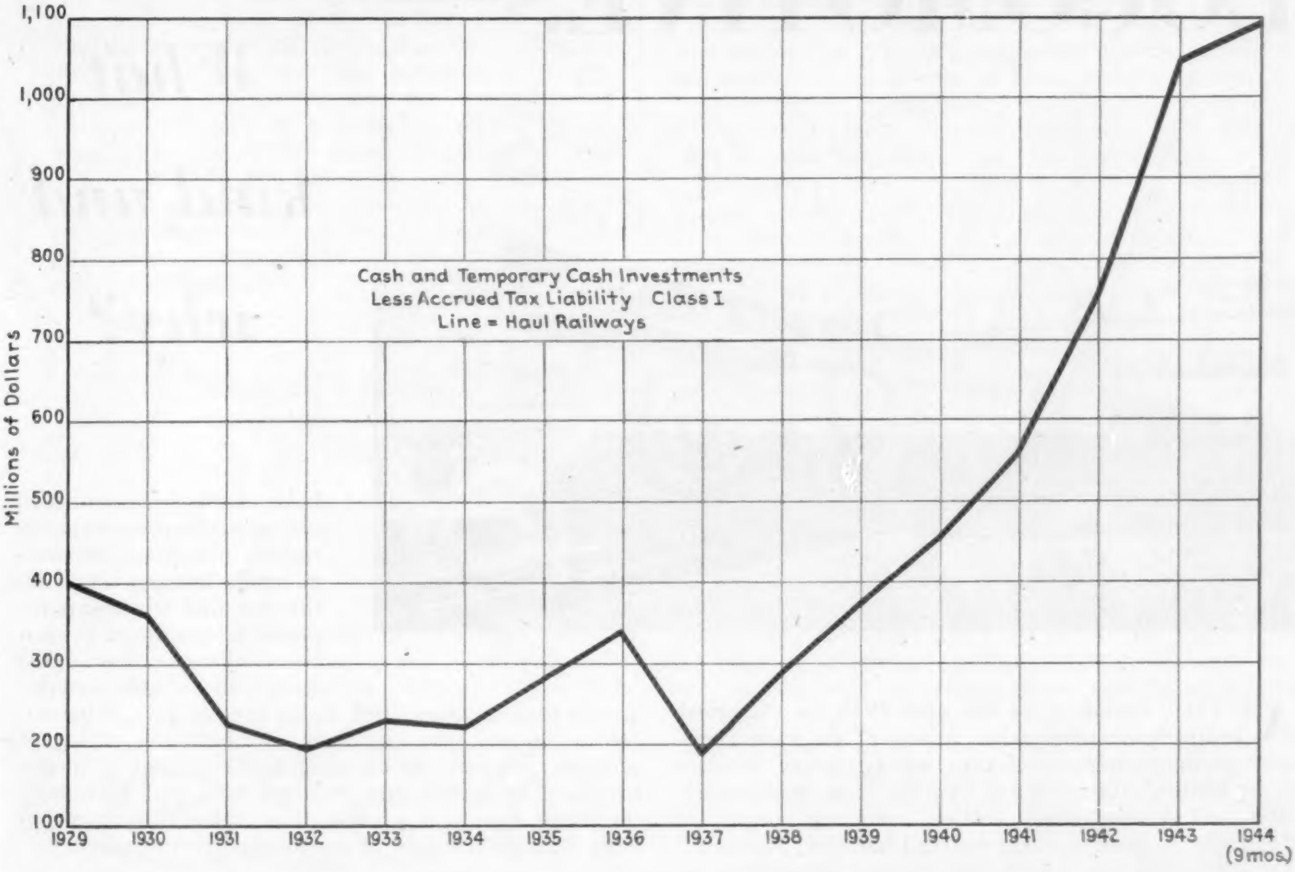
Not only should the railroads be in a position to initiate expenditures for improvements on a large scale when the war ends, but they will have a strong competitive incentive to do so, as our booklet surveying the railway market for manufacturers points out. Rival forms of transportation appear to be certain to secure further large assistance from the public treasury in the form of fixed facilities built at the taxpayers' expense; and it will require intensive resourcefulness on the part of the railroads to hold their own against such rivals who have their rich Uncle Sam in the background to offset with subsidies and other political favors whatever they may lack in intrinsic customer-appeal. It will be some little time after the war ends, however, before the enlarged socialized assistance to other forms of transportation can

Table II—War-Time Increase in Cash and Current Assets of Individual Large Railroads

	Cash & Temporary Cash Investments Sept. 30			Total Current Assets		Total Current Liabilities		Excess of Current Assets over Liabilities		
	1944	1941	Inc. or Dec. %	End of Sept. 1944	End of Sept. 1941	End of Sept. 1944	End of Sept. 1941	End of Sept. 1944	End of Sept. 1941	Inc. or Dec. %
Alton	$7,908,866	$1,170,765	+576	$15,394,716	$3,464,763	$11,451,727	$3,339,725	$3,942,989	$125,038	+ 3,053
Atchison, Topeka & Santa Fe	180,808,919	58,657,402	+208	254,311,047	118,838,956	198,508,070	41,283,880	55,802,977	77,555,076	− 28
Atlantic Coast Line	62,517,972	12,823,694	+388	90,144,844	22,763,323	61,347,336	11,024,065	28,797,508	11,739,258	+ 145
Balto. & Ohio	65,746,217	32,005,796	+105	121,366,681	57,593,956	85,384,400	28,546,091	35,982,281	29,047,865	+ 24
Boston & Maine	15,337,991	6,610,868	+133	30,035,011	15,020,621	21,345,390	11,332,144	8,689,621	3,688,477	+ 136
Central of Georgia	20,657,248	2,060,260	+903	28,977,057	6,605,629	11,828,758	4,085,946	17,148,299	2,519,683	+ 581
Central of New Jersey	8,615,817	7,708,699	+ 12	31,222,154	13,296,299	16,072,111	7,156,374	15,150,043	6,139,925	+ 147
Chesapeake & Ohio	49,474,416	39,376,413	+ 26	81,148,560	70,345,516	76,362,317	37,934,360	4,786,243	32,411,156	− 85
Chic. & E. Ill.	8,810,443	2,946,584	+199	13,593,649	4,983,136	8,360,530	2,260,864	5,233,119	2,722,272	+ 92
Chic. & Northwestern	45,779,907	30,861,791	+ 48	72,587,389	52,251,756	49,533,583	19,903,143	23,053,806	32,348,613	− 29
Chic., Burl. & Q.	55,583,347	21,279,903	+161	94,337,903	46,448,243	13,408,158	18,495,620	20,929,745	27,952,623	− 25
Chic. Great Western	8,469,054	2,595,208	+226	11,763,929	5,388,421	7,371,142	3,428,985	4,392,787	1,959,436	+ 124
Chic. Mil. St. P. & P.	125,072,778	32,345,253	+287	170,543,992	55,054,591	51,126,392	22,886,437	119,417,600	32,168,154	+ 271
Chic. R. I. & P.	97,796,593	15,102,997	+548	125,384,280	29,257,976	48,086,204	11,559,216	77,298,076	17,698,760	+ 337
Chic. St. P. M. & O.	13,862,747	1,957,559	+608	17,506,041	4,815,051	4,873,530	2,868,598	12,632,511	1,946,453	+ 549
Del. & Hudson	4,989,057	5,660,571	− 12	13,100,470	10,356,727	6,249,651	4,683,606	6,850,819	5,673,121	+ 21
D. L. & W.	5,972,059	5,320,447	+200	35,405,327	10,609,370	19,368,501	10,532,133	16,036,826	77,237	+20,663
Denver & R. G. W.	18,937,437	3,968,946	+377	32,431,660	9,406,809	19,747,543	9,329,786	12,684,117	77,023	+16,367
Duluth M. & I. R.	20,901,601	23,344,610	− 10	25,528,257	26,426,040	16,003,420	9,723,692	9,524,837	16,702,348	− 43
E. J. & E.	10,177,469	14,142,496	− 28	14,018,403	16,565,577	9,566,703	8,996,297	4,451,700	7,569,280	− 41
Erie	39,692,992	19,758,387	+101	65,590,812	37,490,112	39,705,669	17,281,697	25,885,143	20,208,415	+ 28
Grand Trunk Western	1,340,676	2,182,538	− 39	7,284,965	6,715,617	7,279,454	4,958,783	5,511	1,756,834	− 97
Great Northern	40,559,364	31,232,705	+ 30	82,166,432	48,853,112	58,694,651	24,685,298	23,471,781	24,167,814	− 3
G. M. & O.	10,230,142	6,033,164	+ 70	16,877,000	11,795,009	8,266,520	4,718,508	8,610,480	7,076,501	+ 22
Ill. Central	76,997,606	21,359,849	+260	115,725,739	48,241,749	90,271,540	27,873,398	25,454,197	20,368,351	+ 25
Lehigh Valley	18,670,626	14,131,926	+ 32	38,395,118	19,537,656	23,145,859	14,323,855	15,249,259	5,213,801	+ 192
Long Island	5,890,820	950,638	+520	11,266,562	4,604,599	8,230,133	4,865,790	3,036,429	−261,191	*
L. & N.	77,399,152	34,026,440	+127	125,415,091	53,292,968	72,923,051	21,809,450	52,492,040	31,483,518	+ 67
M. St. P. & S. S. Marie	14,120,092	5,603,059	+152	24,090,234	9,014,803	12,187,039	16,129,982	11,903,195	−7,115,179	*
Mo.-Kan.-Tex.	14,689,302	3,381,480	+334	24,971,585	7,142,237	23,794,709	6,506,292	1,176,876	635,945	+ 85
Mo. Pac.	110,940,256	28,300,753	+292	153,024,043	49,103,883	70,303,489	11,676,182	82,720,554	37,427,701	+ 121
N. Y. Central	199,615,090	39,773,886	+402	303,772,934	125,401,909	166,586,983	76,037,496	137,185,951	49,364,413	+ 178
N. Y., Chi. & St. L.	22,837,768	5,630,806	+306	35,853,500	22,686,088	28,888,220	16,499,315	6,965,280	6,186,773	+ 13
N. Y., N. H. & Hartford	48,584,661	8,279,120	+487	82,019,174	41,988,990	47,059,055	44,760,119	34,960,119	−2,771,129	*
Nor. & West.	66,425,954	39,364,422	+ 69	90,784,768	60,814,836	58,663,341	28,513,261	32,121,427	32,301,575	− 1
Nor. Pacific	50,195,241	17,996,447	+179	90,998,688	43,918,623	44,420,368	15,172,006	46,578,320	28,746,617	+ 62
Pennsylvania	228,067,226	86,700,104	+163	361,062,193	180,993,915	234,607,561	105,366,976	126,454,632	75,626,939	+ 67
Pere Marquette	14,577,558	6,880,233	+112	23,560,832	13,661,357	15,171,058	7,693,574	8,389,774	5,967,783	+ 41
Pitts. & L. Erie	16,520,374	7,549,528	+119	21,966,551	11,812,496	13,402,782	9,176,177	8,563,769	2,636,319	+ 225
Reading	12,693,219	13,548,417	− 6	34,823,803	23,002,689	33,540,248	17,366,177	1,283,555	5,636,512	− 77
St. L.-San F.	40,825,302	16,261,539	+151	58,862,469	24,574,386	24,362,942	6,384,716	34,499,527	18,189,670	+ 90
St. L. S. W.	28,458,448	2,882,962	+887	39,815,797	9,758,660	27,472,530	8,726,609	12,343,267	1,032,051	+ 1,096
S. A. L.	46,601,184	8,139,827	+473	68,717,474	18,450,213	34,955,705	8,340,393	33,761,769	10,109,830	+ 234
Southern	101,270,089	15,137,662	+569	138,718,487	44,760,245	94,423,059	26,941,339	44,295,428	17,818,906	+ 149
Southern Pacific	174,858,426	29,954,259	+484	286,994,982	70,531,073	208,196,868	42,176,425	78,798,114	28,354,648	+ 178
Texas & Pacific	31,084,676	3,748,877	+729	45,036,185	11,921,546	28,413,426	5,327,044	16,622,759	6,594,502	+ 152
Union Pacific	229,546,252	43,109,403	+432	315,549,775	86,282,041	168,958,935	39,549,655	146,590,840	46,732,386	+ 214
Wabash	31,337,855	13,836,782	+126	53,087,835	21,526,525	36,287,217	6,394,111	16,800,618	15,132,414	+ 11

* Current liabilities exceeded current assets in 1941.

Cash Accumulation Decelerates, But Continues to Increase



be made fully effective; and that time interval will afford the railroads the opportunity to get their plants and their organizations in shape to meet the competitive onslaught with which the federal government is preparing to demonstrate the quality of its gratitude for the railroads' service to the war program.

Why Investors Are Discouraged

The railroads will, thus, as a matter of self-preservation have every incentive in the period immediately following the war to make heavy expenditures to improve the efficiency and attractiveness of their services. They give promise, furthermore, for reasons already adduced herein, of having sufficient funds to initiate such outlays on a large scale. The need and the opportunity which confronts them in the acquisition of particular types of equipment or improvements are analyzed in following articles in this issue. Some measure of the railroads' efforts to assure the most for their money in such additions and changes as are calculated to meet their necessities is given in the preceding article in this issue, which recounts the year's activities of the Railroad Committee for the Study of Transportation which, under the aegis of the Association of American Railroads, is examining critically every aspect of railroad operation, policy, and environment with the purpose of making all adjustments necessary to enable the carriers to conform most effectively to their circumstances.

Predictions such as the foregoing—optimistic for the short run, alike for the railroads and the manufacturers who supply their needs—must be qualified for the long run, on the basis of all tangible information yet available. So long as unpredictable and apparently unlimited capital funds are available from the public treasury for the financing of fixed plant investments for the use of all other agencies of all-commodity transportation except the railroads, such outlays being donated to users at a nominal charge or absolutely free, the railroads will be faced with a grave handicap in their supply of capital funds for desirable improvements, regardless of the certain productivity of such capital. Private capital, which expects to be paid a wage and which must pay taxes, cannot avoid being hesitant about going into competition with an unpredictable volume of governmental capital which exacts no wage and pays no taxes. The railroads can finance a substantial share of the improvements they require from their earnings, but additions and betterments on a scale to correspond with the nation's probable industrial expansion will call for the sale of securities to investors. Experience during the past 15 years indicates that the major part of such securities should be equities rather than fixed-interest obligations. Railroad equities have been selling recently in the stock market at an average of a little over 45 on the Dow Jones index, indicating that the railroads, generally speaking, cannot raise new capital by the sale of equity securities. While railroad equities are selling at less than 50, industrials are selling at 150.

Back in 1928 when railroad net earnings were about equal to those at present, railroad equities were selling at prices about 100 points higher than now.

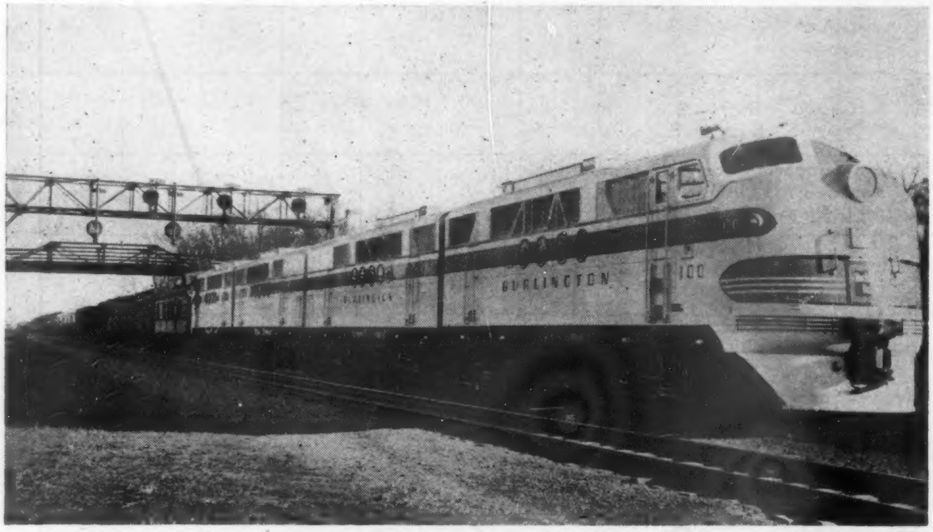
Improvements a Military Necessity

The *net* increase in railroad investment in road and equipment in the 1920's was approximately $6 billions. But for the additions and improvements then made, the railroads could not conceivably have made their current

(*Continued on page 47*)

LOCOMOTIVES—

What kind and why?



AT THE beginning of the year 1945 the American railroads find themselves in one of the most favorable positions with respect to motive power in their entire history. The interpretation placed upon this statement will depend almost entirely upon the position of the reader in relation to the railroad industry, his knowledge of the motive power situation and his attitude toward it. The justification for the statement lies in the fact that the roads have many types of power to choose from; new types in prospect and a wealth of operating experience as a guide in formulating policies for the future.

There is little need to repeat here the performance records that have been made by all types of motive power in all classes of service on American railroads during the past three years, for the job that has been done in both road and switching service has been recorded so many times that it is now a familiar story.

Many months ago the traditional seasonal peaks which have characterized railroad operation disappeared in the rapidly mounting increases in traffic brought about by the war and have been replaced by a series of month-by-month records that stretch in an unbroken sequence from October, 1941, to the present date. Whereas, before the war, the four-week October peak period of each year required the use of 75 to 80 per cent of the entire locomotive inventory, we are now and have been for many months operating at a traffic rate requiring more than 85 per cent of the locomotive inventory.

Utilization Now the Important Factor

Prior to the outbreak of the war, it was a generally accepted idea in railroad operation that a satisfactory condition as to motive power needs was one in which there existed a reasonably safe margin of serviceable locomotives to be drawn upon for unforeseen emergencies. What that safe margin was is indicated by the records of stored and shopped locomotives in relation to the ownership. The condition created by the sudden increase in demand as a result of wartime traffic left railroad operators with little choice in the matter of safe margins, for suddenly

Table I—Selected Statistics of Motive Power and Freight Train Performance

	Total freight locos.	Unserviceable	Stored Serviceable	Active locos.	Per cent active to total	Loco. miles (000)	Gross ton-miles (000,000)	Freight train-miles (000)	Freight car-miles (000,000)
1929	1	2	3	4	5	6	7	8	9
October	28,912	4,417	2,680	21,755	75.3	64,756	110,444	56,748	2,785
1942									
February	21,841	3,238	916	17,687	80.9	55,030	100,489	48,030	2,341
October	22,027	2,344	340	19,343	87.8	70,461	141,880	60,717	3,155
1943									
January	21,974	2,509	352	19,113	86.9	67,152	126,930	57,966	2,790
February	22,048	2,629	297	19,130	86.7	62,962	121,919	54,246	2,660
March	22,075	2,676	282	19,117	86.6	70,103	137,148	60,344	3,028
April	22,030	2,585	283	19,162	87.0	67,524	134,882	58,295	3,001
May	22,067	2,593	364	19,110	86.5	69,491	141,453	59,801	3,131
June	22,09[illegible]	2,595	376	19,125	86.5	66,071	132,549	57,110	2,959
July	22,08[illegible]	2,471	406	19,206	86.9	69,311	143,568	59,758	3,151
August	22,031	2,677	395	18,959	86.0	69,296	144,817	59,711	3,183
September	22,107	2,666	355	19,086	86.3	67,680	140,771	58,373	3,110
October	22,037	2,703	335	18,999	86.2	70,084	145,076	60,355	3,185
November	22,205	2,740	308	19,157	86.2	66,448	133,356	57,338	2,937
December	22,259	2,601	315	19,343	86.8	67,433	133,254	58,325	2,918
1944									
January	22,351	2,666	310	19,375	86.6	68,927	137,118	59,489	3,020
February	22,341	2,808	307	19,226	86.1	66,547	132,795	57,367	2,913
March	22,291	2,609	264	19,418	87.1	70,993	142,638	61,306	3,165
April	22,265	2,814	341	19,110	85.8	66,868	137,350	57,832	3,043
May	22,316	2,783	436	19,097	85.5	69,279	144,110	59,894	3,167
June	22,199	2,682	498	19,019	85.6	66,136	138,663	57,179	3,044
July	22,253	2,804	495	18,954	85.1	67,478	141,533	58,315	3,115
August	22,334	2,707	493	19,134	85.7	68,149	144,163	59,067	3,157
September	22,388	2,758	462	19,168	85.6	65,106	137,172	56,329	3,002
October	.....	....	....	.....	...	67,948	143,539	58,884	....

Data in Columns 1 to 4 from I. C. C. Statement M-240 OS-F; columns 6 to 9 from I. C. C. Statement No. M-211 OS-A; Column 5 calculated

Management today is greatly in need of a practical appraisal of the entire question of motive power. The realization has come, at last, to the fact that the locomotive is not primarily a machine but is an operating facility which has value only when it is being used. The Diesel has made railroads utilization conscious and there is every reason to believe that greater service can be obtained from steam power than it is now giving. The important consideration is to continue the search for methods.

By H. C. WILCOX
Associate Editor

they found themselves in the position, not only of using up practically all of the reserve motive power that was available but also of being in the very difficult position of not being able to turn to the builders for new power to supplement their needs.

Fortunately many railroads had partially fortified themselves against such an emergency by the purchases, over a period of some five to ten years, of modern high-capacity steam units and the adoption of the Diesel-electric locomotive in both road and switching service.

The operating advantages of the Diesel-electric are well known and it is sufficient to say that the records it has established in a time of great need have brought home to railroad managements the value of, and the possibilities in, intensive utilization of power. The Diesel-electric provided competition that has acted, like the electric locomotive some 20 years ago, as a challenge to steam. Its outstanding performance in selected classes of traffic has developed within railroad operating and mechanical organizations both the necessity and the desire to find out whether or not steam power could approach these performances. The same challenge has also been responsible, together with many technological developments as a result of the war, for a renewed interest in experimentation with several new types, such as the steam-turbine and the gas-turbine locomotives.

All of these factors combine to create a situation wherein the railroads are occupying, whether safely so or not, a grandstand seat at one of the world's greatest transportation performances and, viewing as they can, the men and the machines with which this act has been assembled, feel reasonably sure that they are justified in waiting to see what will happen next—which is just another way of saying that they are, at the moment, in the position of having done an excellent job with the tools at hand and are waiting to see what direction the

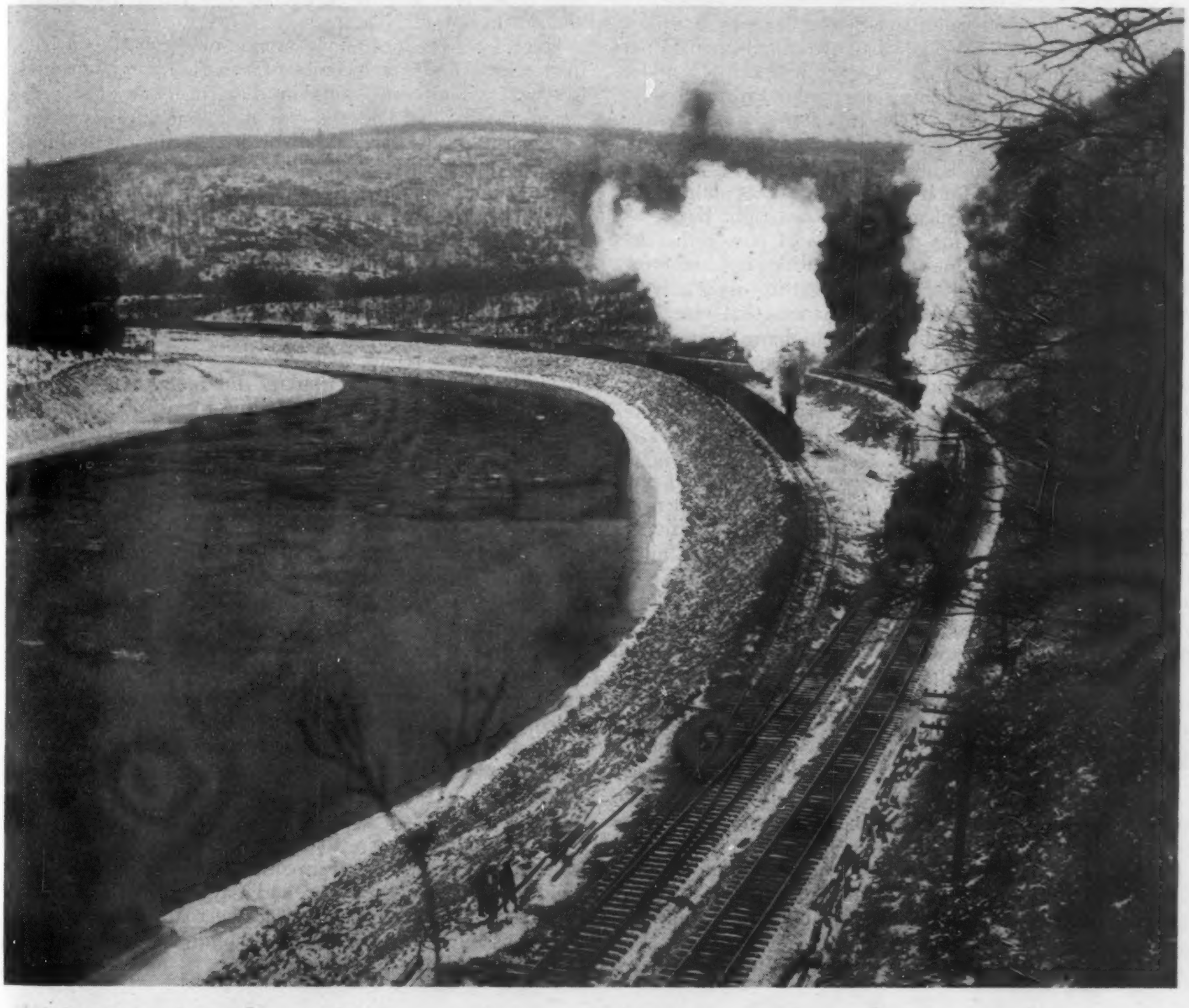


Table II—Comparison of Locomotive Mileage by Type of Power and Class of Service
(Nine Months Ending Sept., 1944)

	1944 (000)	1943 (000)
Road Freight Service:		
Steam	582,827	592,493
Electric	11,002	10,602
Diesel*	14,565	6,448
Total	608,395	609,544
Road Passenger Service:		
Steam	307,205	296,839
Electric	18,776	18,201
Diesel*	24,864	30,767
Total	350,845	345,807

* Includes gasoline and other locomotives.

developments of the immediate future will take before embarking on extensive programs of equipment replacement. In what other way could we account for the fact that, in a period of such high traffic demand as we have at present and with such prospects for future traffic, the railroads placed orders for such a limited number of locomotives during the past year?

The operating department of a railroad forms its judgment of motive power from such factors as availability and failure-free performance in service. Being the custodian of gross ton-miles, it knows that the locomotive that can spend the greatest number of hours per day out on the road in revenue service may be the cheapest, on a ton-mile basis, in the long run.

It is not in the least concerned with matters of design or in any considerations not directly related to the utilization of locomotives. In short, it does not care how or where the mechanical department gets the locomotives that it produces on call just so long as they are there when needed and do the job they are called upon to perform. An appreciation of this fact will help to understand why the Diesel has been so popular with the operating man and why it has been called the "answer to an operating man's prayer," for it came into the railroad picture at a time, and under conditions, that have not only made it possible for it to demonstrate its abilities and economy on a ton-mile basis in its own right but it has served to set a pace for other types of power that has brought out hidden values and possibilities not heretofore realized. The impetus of this pace-setting is largely responsible for the operating performances that places the railroads today in a position of confidence born of accomplishment. It also places them in a position in which there is danger—and opportunity.

Economics the Final Answer

This war is not going to last forever. When it ends the railroads will again be faced with the problem of conducting business in a world of intense competition in the field of transportation and where success or failure will depend entirely upon the ability to meet that competition on a profitable basis.

Experience in the conduct of transportation by rail has shown those whose responsibility it is to acquire and operate motive power that a factor of major importance in the selection of motive power is the volume and the spacing of traffic loads. On roads where traffic density is high and continuous, where possibly congestion at terminals is great, the price that can profitably be paid for the power to move trains may well be high. On other roads, or other divisions, where volume and the spacing of load periods is quite different the cost per locomotive-mile may well have to be considerably lower. In this self-evident fact lies the answer to those who may be inclined to conclude that one, or another, type of locomotive is the best type with which to move trains.

Possibly there never has been a time in railroad history when management was so greatly in need of a coldly, practical appraisal of the entire motive-power question. The operating department, experienced as it is with the costs of operation and the problems connected therewith, is qualified to speak with authority within the realm of its functions and experience but management has every right to look to the mechanical department for the answers to questions concerning design, maintenance and type of motive power. Management today must also look to someone for the answers to questions relating to the economics of the motive-power problem and on all too many roads finds itself in the position of being obliged to get answers from the operating department that should come from the mechanical department.

Management is also faced with the necessity of apportioning expenditures for improvements between motive power and rolling stock, roadway improvements, shop and terminal improvements and a myriad of other opportunities for worthwhile investment.

The Motive Power Battle

The largest items in the entire category of railroad expenditures are locomotive repairs and locomotive fuel. The proponents of Diesel power not only claim that it will not only save the railroad millions of dollars in these two expense items alone but that it is an operating facility with none of the disadvantages of steam power. Those who back the steam locomotive claim that, if given the same chance, it will do just as good a job as the Diesel and do it cheaper.

Here are two sides of the motive-power battle; a battle in which the steam locomotive is not holding its ground too well. The contestants in this battle are not only steam versus the Diesel locomotive but the operating versus the mechanical department. Railroad management stands as the referee and in most cases has already recognized that there are intangible factors involved in this problem that it might be well to investigate carefully before final decision is made.

The mechanical officer must recognize that it is no longer a question of how many locomotives to buy; or what kind. What management wants to know is whether to buy locomotives (of whatever type); spend money for roadway, or repair facilities, or signals—and why.

Those who are promoting the interests of the Diesel have done an excellent job in selling to railroad managements, not a locomotive but an operating facility having potentialities that contribute to efficient and economical transportation. The steam locomotive has rarely ever been *sold* to anyone—it has been *bought* by the mechanical department not as an operating facility but as one of the tools of the trade. If the steam locomotive has operating potentialities that are not sufficiently recognized; if it is capable of doing a better operating job than it has been given to do, then those who promote the interest of the steam locomotive must recognize that it is management—the referee—that must be sold on the value of modern steam power. The railroads are entitled to have all the facts in a case of this kind and if one type of motive power is better than another let's find out why. Conclusions should not be prejudiced for, after all, it is the interests of the railroads that are at stake.

Unfortunately, from the railroad standpoint, motive power and its operation involve such tremendous expenditures that every hour and day in which obsolete facilities are continued in service the roads are spending —or possibly throwing away—the dollars that would help pay for their future success.

traffic VOLUME *continues heavy*

The Railways of the West Are Prepared to Handle All Traffic Up to Capacity of the Pacific Ports

Renewed demands upon railways for war-time transportation are met by efficient operating methods and ingenuity

By CHARLES LAYNG
Western Editor

That the railways to the West will be able to handle all traffic up to the ultimate capacity of Pacific Coast ports is indicated by studies reviewed in this article. So far, the railways have handled a steadily increasing traffic volume with only an occasional tight spot and no indication whatsoever of any breakdown. The ports throughout the country continue to be in fluid condition, despite increased traffic flow. The demands for increasing the oil movement by rail and for handling the country's record agricultural harvest are being met currently, despite the fact that military traffic increased 25 per cent in the fiscal year ending in June, 1944.

LAST year, in the Annual Statistical and Outlook number of *Railway Age*, the prediction was made that, despite any increase in freight traffic in 1944, the railways would be able to handle the war-time business. That this prediction has been fulfilled is evidenced by the fact that an estimated 740,000,000,000 ton-miles were handled in 1944 as compared with 727,047,608,000 in 1943. The magnitude of this task can be more readily appreciated when a comparison is made with previous years. In 1918, the heaviest traffic year of the First World War, 405,369,284,206 revenue ton-miles were handled. In 1929, the year of peak loading prior to the economic depression, the figure was 447,321,561,129. At the low point of the depression, in 1932, the figure was only 233,977,008,859. In 1939, the last peacetime year that was unaffected by the defense program or by war production the figure was still only 333,438,412,026.

These figures indicate the truly stupendous task that the railways have performed and, while they have done a magnificent job, it was by no means an easy task, in view of the shortages in materials and in man-power. The job was done by the exercise of ingenuity and constant watchfulness on the part of the railway officers and hard work and long hours on the part of the railway employees. To this must be added the successful and effective co-operation given to the railways by the shippers and receivers of freight throughout the country. Without either of these three aids the task of handling the unprecedented volume of freight transportation would have been impossible.

To the other agencies which made outstanding contributions to the handling of the nation's war-time freight must be added the Office of Defense Transportation, the Interstate Commerce Commission, and the Association of American Railroads. Since a sizeable proportion of this freight moved under direct control of the Army and the Navy, complete co-operation on the part of the officers of our armed forces charged with supervising transportation was necessary and such co-operation was given in full measure. The only jarring note of the year was supplied when Attorney General Biddle's cohorts in the Department of Justice threw a monkey-wrench into the machinery by bringing suit against the western railways under the Anti-Trust Act.

Interest Focused on Western Railways

Following the successful invasion of France and the increasing possibility of a speedy end to the war in Europe, more and more interest was focused upon the western railways, since obviously when the United States is able to devote the major part of its attention to the prosecution of the Japanese war, the traffic load of the western railways will be materially increased. A great many studies of this situation have been made by the railways themselves and by other interested agencies, but the answer is always the same, namely, that the western railways will be able to handle into the Pacific Coast ports all the traffic that ships can take out of such ports. The ultimate capacity of the Pacific Coast ports must remain a military secret. However, this capacity is known and, therefore, the statement that the railways can handle the business is based on exact calculations and not guesswork.

It is of interest to note that on November 27, 1944, the western railways handled 3,923 carloads of freight from the East into California, which is an all-time peak day The Santa Fe, with 1,644 cars moved out of Winslow, Ariz., led the other railways on that date but without exception all the roads showed a substantial increase. The relative importance of this increase is shown by the fact that the same roads handled only 2,706 cars into California on the same date in 1943; thus the increase for that particular day in 1944 over 1943 amounted to 1,207 carloads. The average number of loads moved from the East into California daily during November, 1944, was over 3,300 as compared to an average of 2,814 in November, 1943.

The movement of freight from the East into the northwestern ports is also showing a steady, if not as spectacular an increase. The average loads handled into the northwestern Pacific Coast states by the four railways serving that area amounted to just over 1,400 cars daily in November, 1944, as compared to an average of 1,282 cars in 1943.

Rerouting Aids Movement

The reason for this excellent showing by the western railways is found in part in the huge expenditures made by such railways immediately before and during the war and in the operating ingenuity displayed in utilizing the facilities procured as a result of these expenditures. Much credit should also be given to the joint agency set up by the Office of Defense Transportation, the Interstate Commerce Commission and the Western Association of Rail-

All United States Ports Have Remained in a Fluid Condition Without Undue Accumulation of Cars

The Eastern Railways Have Been Called Upon to Handle an Increased Volume of Oil

way Executives, under the direction of W. F. Kirk as agent for all three of these organizations.

Simply explained, Mr. Kirk's job is to serve as a sort of glorified chief dispatcher for all the railways serving the Pacific Coast and the intermediate carriers serving as part of through routes to the Coast. It is the job of this agency to keep a close watch on all of these railways and when it appears that one route is being overloaded beyond its capacity, to issue orders rerouting a certain amount of the traffic to relieve the distressed railways and to make use of excess transportation capacity which may exist on the other lines.

During the last nine months of 1943, after this agency had been set up, it issued 114 orders involving the diversion of 91,000 cars. This year somewhat fewer orders were issued but an estimated total of 140,000 cars was diverted from lines specified in the shippers' routing to other lines that were better able to handle them at the time. These diversion orders are by no means static, as the situation is watched carefully and the orders are changed promptly as the changing conditions justify. It should be understood that such diversion orders are issued covering traffic moving east as well as westbound traffic.

Recommended Practices

An indication of the improved situation in the West is to be found in the fact that 26,803 cars were held out of terminals for more than two hours in this area in 1943 as compared with a total of less than 10,000 cars so delayed in 1944. While the road movement of cars to the Pacific Coast still leaves room for some improvement, its present status is considered satisfactory. The handling at Pacific Coast terminals has at times been subject to delays but, as a result of careful study, this situation is rapidly being ironed out by the adoption of new operating methods that are based upon mutual benefit rather than competitive spirit among the railways involved. As outlined in another article in this issue, the situation with regard to man-power has improved materially as far as road crews are concerned but there is still a rather acute shortage of man-power in the terminals and this is particularly true of the San Francisco Bay area.

To assist in the terminal handling of the present business to the West Coast and to prepare for a future increase, Mr. Kirk, after consultation with operating officers on the ground, has issued seven recommendations, as follows:

1. Anticipate the car arrivals so they may move direct to placement instead of being switched to a track "for disposition."

2. Anticipate car arrivals subject to reconsignment so that the reconsignment can be made on arrival of the car in the train yard instead of being switched to the hold yard.

3. Loaded cars should not move after loading is completed except on billing to final destination, thus avoiding switching them to the hold yard to await billing instructions.

4. Industries which unload and load cars should, whenever possible, use the cars unloaded for their outbound loading, instead of ordering other empties, which involve additional switching and consequent loss of man-power productivity.

5. Avoid, whenever possible, the switching of cars from one location to another particularly within a terminal and from one carrier to another through interchange tracks.

6. For convenience, certain points are designated for the weighing, reconsigning or other servicing of cars, which at one time was probably the best point; but changed conditions may have placed a burden on that location.

7. Weighing and otherwise servicing cars requires time, men and motive power, and, wherever possible through the available mediums, should be reduced to actual necessity.

The Oil Movement

The eastern railways have, of course, participated in the transcontinental movements referred to above but currently the "hottest" thing on the eastern railways is the handling of oil. As a result of the completion of the Big Inch pipe line, for most of the year the eastern railways were handling an average of about 500,000 bbl. of oil a day. Recently, however, they have been asked to increase this to 700,000 bbl. per day and the situation is complicated by the fact that some 500 loaded tank cars are moving daily from the oil fields to the Pacific Coast and this, of course, has affected the over-all tank car supply. On November 25, Col. J. M. Johnson, director of the O. D. T., called upon government departments, railway officers and industry heads to take steps to meet the critical situation.

Every available tank car on American railroads is now in use, Colonel Johnson explained. Since the upwards of 15,000 additional tank cars needed cannot be obtained by new construction, he urged upon the Secretary of War, Secretary of the Navy and the Treasury Department's director of procurement a more efficient use of tank cars now in service, and a faster turn-around time. These, he said, are the main sources from which relief can be expected. Referring to a tendency in the petroleum industry, as well as in Army and Navy plans, "to reduce transportation costs by utilizing lower cost facilities," Col. Johnson pointed out that the time "is not opportune for this change and every facility, regardless of comparative

cost, must be utilized if we are to perform the transportation required."

In addition, Col. Johnson recommended that for the emergency, "the most available and efficient form of transportation be used from every shipping point, and every effort made to release tank cars so that they can be used on long hauls where they are more effective," utilizing other forms of transportation for shorter hauls. A re-check of all sources of supply was urged upon those in charge of procurement of petroleum products, "so that they can be certain they are using the source nearest to the point of consumption that will meet requirements." Where a seven-day week and a 24-hour workday are not now in force, such a schedule, it was insisted, must be installed immediately.

To railroad presidents—through J. J. Pelley, president of the Association of American Railroads—Col. Johnson wrote that the need for tank cars can be "supplied only by better utilization and faster movement of the existing fleet. In the past several months tank car turn-around times have lengthened. We must speed up these cars."

Saying that permits to ship petroleum and its products in tank cars, for distances less than 200 miles, would be screened more carefully than ever before, Col. Johnson asked the heads of oil companies to be certain there were no other means of transportation available—regardless of cost—before requesting such permits. "Economy," said Col. Johnson, "cannot be given its usual consideration in such an emergency as this."

In the endeavor to avoid the use of tank cars for relatively short haul business, where tank trucks could conceivably be used, on December 1 the O. D. T. restored the permit system for tank cars moving 200 miles or under. Previously permits were required only for tank cars moving 100 miles or less.

The Port Situation

In 1943 there were unloaded in the United States ports 1,461,723 carloads of export freight, or an average of 3,997 cars per day. This was considered an outstanding record, but in 1944 the average per day was over 5,100 cars during most of the year. Even so, the railways serving the ports and the ports themselves remained in a fluid condition as the result of continued intensive work and co-operation with the railways on the part of the shippers and receivers and the agencies responsible for the movement of export freight. The Army, the Navy and the several lend-lease forwarding agencies have maintained close supervision over the movement of freight for which each is responsbile and, as a result of this close supervision, there has not been an acute situation at any port at any time.

According to a report of Lt. Gen. Somervell, the railways moved 90 per cent of all Army traffic in the fiscal year ended with June 30, 1944. Within the United States, commercial carriers hauled over 95,000,000 tons of Army traffic in the year in question, which was an increase of 25 per cent over such traffic for the preceding fiscal year. Such freight requires a very large number of high class box cars for the loading of munitions, explosives and food stuffs. In addition to this Army use, the supply of box cars available to commercial users is further diminished by the fact that box cars are wearing out faster than they can be replaced under the current restrictions on building such cars. For example, on October 1, 1944, there were 4,500 fewer box cars in service than on the same date in 1943 and 14,875 fewer than on the same date in 1942. This decrease in ownership is about equally divided as between the eastern and western railroads.

A further complicating factor has been the unusually large agricultural harvest in 1944. The wheat crop was the largest the country ever produced and during the grain harvest the car supply at country stations was short of current requirements. This, however, was not the controlling factor in delaying the movement of wheat from the country elevators and farms into the terminal markets as, because of the man-power shortage and other reasons, such terminal markets were not able to absorb the flow of wheat currently and there were enough box cars available for all wheat that could be put into such markets. In addition to the huge wheat crop, the sorghum grain crop was one-third larger in 1944 than any such crop the country has ever previously produced. The tobacco crop was also larger than ever before. The soy bean crop, while slightly less than last year, was 60 per cent larger than the average of the last ten years. The rice crop was approximately equal to that of 1943 and was 37 per cent above the average of the last ten years. The crop of oats was 4 per cent above that of 1943 and 16 per cent larger than the average of the last ten years. The barley crop also was very large, being 13 per cent above the ten-year average.

Because of heavy movements of livestock in western and southeastern territory, the stock car supply was tight in spots but the Car Service division of the A. A. R. relieved this to a certain extent by moving some 600 stock cars from the eastern railways to the West. The refrigerator car situation remains tight despite close supervision by the Car Service division and the elimination of loading of commodities in refrigerator cars that can possibly be moved without refrigeration.

While the open top car situation became somewhat easier in the last few months of 1944 than in the previous year, it still remains tight. The coal production in 1944 was estimated to be some 35,000,000 tons over that of 1943 and to complicate matters still further the movement of military impedimenta in gondola cars was on the increase. The movement of such material in freight cars was also very heavy and in fact on one occasion in one section of the country it was necessary to withdraw all freight cars from commercial service for five days in order to make them available for military movements.

No Cause for Alarm

Freight traffic in the year 1945 will probably maintain its present high levels and in addition, depending upon military progress, it will undoubtedly see some rather violent changes in the traffic flow channels that have hitherto existed during the war years. To handle the continuingly great volume of traffic it will be necessary that all of the agencies particularly mentioned earlier in this article continue and increase their co-operation. The fact that in the first part of 1944 the average loading per car decreased 0.95 tons was sufficiently alarming as it seemed to indicate a spirit of complacency on the part of the shippers and a letup in their efforts to secure heavier loading. Fortunately, this tendency did not continue and it is to be hoped that in 1945 there will be no slackening of the shippers' efforts to save cars by loading them heavier.

That the shippers are now handling cars satisfactorily was indicated by the cancellation on December 1 of I. C. C. service order No. 242, which became effective on October 19 and provided for heavy penalty demurrage charges for holding box cars overtime. Continued co-operation and an absence of complacency are vitally essential on the part of both the railways and the shippers, but, given these factors, the railways can undoubtedly continue to handle the huge war-time traffic volume without breakdown.

PASSENGERS *crowd the trains*

Modern Passenger Terminals Have Never Proved More Useful

Despite all discomforts, civilian travel continues at a record volume while military traffic also increases

By CHARLES LAYNG
Western Editor

IN the face of all the efforts of the Office of Defense Transportation and the individual railways to curb civilian travel and in spite of the increasing difficulty in securing reservations and the general discomforts of war-time travel, the passenger traffic volume continues to increase. No matter how much publicity is given to the necessity of avoiding unnecessary trips, that long-deferred urge to visit Aunt Fanny seems to find expression just at the time when the American public should stay at home. The unusual percentage of women on American trains is sufficient proof of the volume of unnecessary travel, if any such proof were needed. There is also a large percentage of the "it doesn't mean me" gentry still clogging trains to attend sports events or going South to acquire a becoming winter sun tan.

Short of rationing of train travel, there seems to be no adequate solution for keeping this large volume of unnecessary traffic off the trains and careful studies of rationing travel have indicated clearly that this would bring on a rash of difficulties that would be rather worse

than the present situation. Fortunately, too, the railways in handling passengers, as in handling freight, have shown themselves capable of performing prodigious feats, despite man-power and material shortages. With the assistance and co-operation of Army and Navy authorities, they have handled all organized troop movements promptly and efficiently. Furthermore, they have handled furlough travel and individual military movements under orders without too much difficulty. The comfortable, luxurious service of peace-time has disappeared for the duration, but somehow, they manage to get all passengers who so desire from where they are to where they want to go and, despite the deterioration of service, they still offer far greater comfort to the war-time passenger than can be had on the passenger trains of any other warring nation.

In the first half of 1944, the phenomenal increases in passenger traffic continued unabated, but about the middle of the year a distinct slackening was apparent and, while passenger service is still in unprecedented volume, it would appear that the peak has been reached. The railways are handling the all-important military traffic efficiently and well with the co-operation of Army and Navy officers. As the traffic volume has shown great gains for years now, experience in various methods of handling the passengers has enabled the railways to keep the service from complete deterioration. The sleeping car situation is in a state of uncertainty, but despite this the Pullman Company continues to handle a great volume of troops and civilian travel efficiently.

Traffic Continues to Increase

Passenger traffic showed an inclination to level off in the last half of 1944. The first six months continued to show the almost fantastic increase over previous record years that has marked the war-time months. This was true all over the country and the rather sudden drop, in the last six months, to relatively small traffic increases of only one to five per cent, was also general throughout the nation. Even so, the estimate of 96 billion revenue passenger miles handled by the railways in 1944 still shows a sizeable increase over the 87,842,212,000 passenger miles handled in 1943. In every other statistical respect, 1944 exceeded 1943 as the record passenger year. It was differentiated from the other war years, however, by the fact that some actual new passenger car construction was authorized during the year. Unfortunately, the 55 passenger cars now being built are a mere driblet compared with the steadily decreasing overall ownership of passenger cars by the railways, but it is certain that 1945 will see many more passenger cars built especially after the conclusion of the war in Europe.

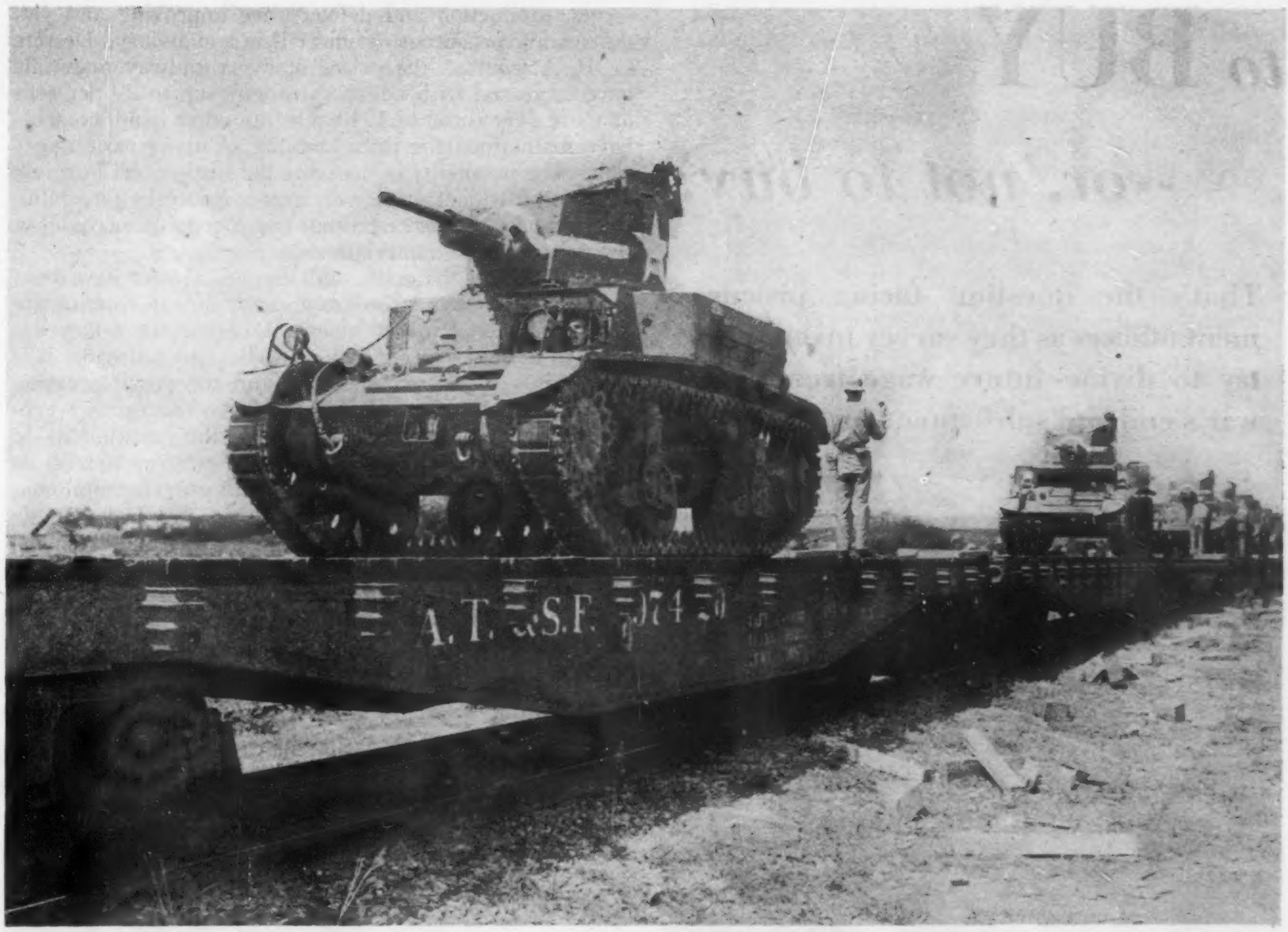
Future Streamliners

As a matter of fact, "orders" (really nothing more than a reservation of so much future car-building space) have been placed with the manufacturers for well over 1,200 new passenger cars. These orders will be fulfilled as soon as war-time restrictions on passenger car building are lifted. The special troop and kitchen cars built in 1943 are serving a purpose relatively more important than their actual numbers would indicate, as they are virtually in constant use, with very little empty mileage involved in the case of the troop sleepers.

The "phantom orders" placed, which are listed in detail in another article in this issue, show a most interesting trend toward an extension of streamlined, high-speed service in various parts of the country as soon as restrictions are lifted. For nearly ten years, the other roads to the Pacific Northwest have not attempted to meet the high-speed competition given them by the City of Portland streamliner operated to Portland, Ore., with a connection to Seattle, Wash., by the Chicago & North Western - Union Pacific. Now, however, orders have been placed by the Great Northern for enough complete trains to streamline completely the Empire Builder (Chicago - Seattle, in connection with the Burlington).

The Wabash also has entered the streamliner field with an order for a new train, the exact use of which has not been specified, but which will undoubtedly parallel existing streamliner

Selling Club Car Seats Has Taken Care of Numerous Additional Passengers



Mixed Passenger and Freight Troop Trains Continue to Move in Large Numbers

competition to the Wabash. Manifestly, too, although no definite plans have been announced, the order for 300 cars by the New York Central presages a large extension to the present streamliner service of that railway. Of interest, too, is the order of the Minneapolis & St. Louis for streamlined cars. This road, in recent years, has been unusually active in improving its property and in freight solicitation, but its passenger business has hitherto been negligible.

Service Details

Railway passenger service, under the impact of an unprecedented passenger volume and a shortage of equipment, has continued to deteriorate, but at a much slower rate than in previous war years. In what the railways now regard as their principal passenger responsibility, however—the handling of troops in group movements—there has been no deterioration, but rather an improvement, if anything. Necessarily, the handling of troops, and of wounded soldiers returning from the battle fronts, must come first and, with the co-operation of Army and Navy authorities, it has been handled without a hitch.

As to handling civilian traffic, the railways are gradually becoming accustomed to and experienced in the handling of the present unprecedented volume of traffic. In many respects, they have virtually revolutionized their methods in handling such traffic to meet the changed conditions. In view of the lessons learned from this added experience, it is logical to predict that, unless this traffic volume increases unexpectedly, the railways will be able to maintain the present level of service (as already stated, the best in the world among warring nations) and perhaps even to improve it, even under existing conditions.

The court decision in the action of the Anti-Trust division of the Department of Justice against Pullman, Inc., has thrown the sleeping-car situation "up for grabs." The decision of the Pullman interests, based on this court action, was to rid themselves of the operation of sleeping cars and concentrate upon the freight and passenger car building sections of their industry. This is by no means as simple of accomplishment as it sounds, since, as has been pointed out editorially in the *Railway Age,* the operation of sleeping cars is, in effect, a natural monopoly, which, despite the opinion of the Department of Justice to the contrary, can render better service to the public as a monopoly than otherwise. The figures for handling troops and civilian traffic in sleeping cars by the Pullman Company during the war years are proof enough of this statement and the evidence seems incontrovertible.

Nonetheless, for better or for worse, some sort of solution must be arrived at before October, 1945, when, according to the court decision, the segregation must be made. The railways are, of course, studying the problem, but, so far, no solution has been advanced. The Pennsylvania has announced that it will be prepared to operate its own sleeping cars, but, beyond this bare announcement, none of the railways have been able to come forward with any declaration of their intentions. The present operation of sleeping cars is so integrated as between the various railways and the Pullman Company as to present a veritable Gordian knot to untangle.

to BUY

--or, not to buy?

That's the question facing procurement officers as they survey inventories, try to divine future wage trends, the war's end and subsequent supply prices

Women Now Play an Important Part in Handling Materials

By C. MILES BURPEE

Purchasing and Stores Department Editor

AFTER three hectic years, during which railway procurement officers have been bedeviled by rigid control, allocations, material shortages, extended deliveries and other forms of torture, comes now a period when most roads have plenty of cash with which to buy any reasonable quantity of material, the War Production Board is reasonably liberal in its approvals and allotments, production and delivery are improving and yet, the average procurement officer is in a quandary. Despite O. P. A. control, the prices of many railway materials have increased with advances ranging up to 29 per cent or more over those of 1940. On the other hand, controls have maintained the price stability of many basic materials. The possibility of breaking the Little Steel Formula and of consequent wage increases point to the possibility of the cracking of price ceilings and inevitable increases in the price of some materials.

Purchases of materials and supplies always have been governed by revenue receipts and any dips in revenue are quickly reflected in retrenchment. Since the policy applies to industry in general, as well as to railroads, it is the basis for price competition and the possible easing of wage rates. Mindful of these facts, the railway procurement officer now is faced with the question as to whether it would be wise for his railway to convert as much cash as possible, consistent with governmental control, into materials at this time in order to offset possibly greater expenditures in the future. Again, another question arises as to whether such action would be worth the risk of deterioration and obsolescence.

Most railway procurement officers are of the opinion that, with the exception of a comparatively short transition period immediately after the defeat of Germany and Japan, this country is scheduled for a period of prosperity.

It is also their impression that after V-E Day, traffic increases ranging from 15 per cent to 50 per cent may be expected for the Western and Midwestern railways, in the process of transferring all of the country's war effort to the Nipponese theatre of war where, unless the unexpected happens and Japan surrenders, the attack will be continued with ever-increasing intensity.

Materials Easier—Inventories Up

The last few weeks of 1944 were marked with the general easing of practically all classes of materials with the exception of steel wheels, steel and malleable iron castings, brake shoes, staybolt iron, electric motors and gasoline engines. Other quarters reported the scarcity of repair parts for Diesel locomotives, signaling material, wire rope and other items of minor importance. Most of these deficiencies may be ascribed to the heavy demand for war purposes while in other instances, particularly in connection with the manufacture of repair parts, procurement officers declare that the manufacturers are more interested in producing new machines and equipment, for which there is a strong demand. Inadequate and inefficient man-power is a third reason for the tight spots.

The monetary value of railway inventories of materials and supplies for Class I roads has increased steadily from $543,000,000 on January 1, 1944, to about $602,000,000 on October 1, according to reports of the Interstate Commerce Commission. Although the total increase has been influenced to a large extent by higher prices for many items, nevertheless there has been a substantial increase in the quantity of materials and supplies carried in stock. With steadily increasing freight and passenger traffic and greater wear and tear on equipment and facilities, it has been necessary to prepare for any eventuality, although in some instances where Eastern roads have already felt a slight falling off in traffic, it has been followed by inventory reductions. These cut-backs have been applied particularly to materials and parts for older classes of locomotives, those that when the reduction of war traffic is more marked will be the first to be retired from active service and placed in storage. The first step

in this connection has been to cut back orders and to arrange for cancellations of orders already booked.

One purchasing officer, while cautioning against overstocking, is of the opinion that a consistent policy of selective purchasing should be followed as protection against the prospect of rising prices. At the same time, another procurement officer warns against the indiscretion of attempting wholesale cut-backs, pointing out the probability of the ineffectiveness of such a plan and the lack of any degree of accuracy in attempting to cut back a shopping list that comprises at least 73,000 items. Pointing to the long training period that is necessary in the development of trained stockmen, storekeepers and clerks, the same officer declared that under present conditions, with so many of these employees now in the armed services, and with substitutes, having weeks instead of years of training, attempting to fill their shoes, considerable trouble and inefficiency might be experienced if, for instance, an attempt were made to issue wholesale orders to reduce stores stocks. The ensuing disorganization of all classes of material, particularly stocks of intricate repair parts for locomotives and air brake systems on railways of 8,000, 10,000 or 15,000 miles or more in length would endanger the entire supply set-up.

Heavy Buying Predicted for 1945

Most railway procurement officers agree that heavy railway buying probably will continue throughout 1945, for it is evident that traffic will continue in good volume until the defeat of Germany and during the interim when the might of the nation will be transferred against Japan. While there may be a reversal in traffic direction during this period, it is anticipated that heavy traffic will continue generally and increase on the roads throughout the Midwest and the West where there will be heavy demands to meet immediate requirements. Additional materials will be required to take care of the accumulated deficiency in maintenance, caused in large part by heavy war traffic that is wearing out equipment and track at a greatly accelerated rate. A proportion of the demand also may be expected as replacements are ordered for substitute materials that were resorted to during critical periods, particularly in instances where the substitutes wear out or are used up sooner than standard materials.

Faced with the loss of so many of their trained employees in purchasing and stores departments, railways have turned to the more extensive use of material handling equipment, the rearrangement of stores facilities, insofar as practicable under the pinch of war-time regulations, as well as revamping, simplifying and eliminating many material forms, used in conjunction with the requisitioning, ordering and distribution of materials and supplies. War has proven the vital importance of railway procurement departments and many railways have sought to improve the efficiency of their storehouses and material handling facilities.

At the close of 1944 it was apparent that the Controlled Materials Plan was doing all that could be expected of a system of central control. Comprising realistic programs carefully laid out by war agencies in accordance with available materials and facilities, and a plan designed to promote the proper flow of materials and products to keep all programs on schedule, the basic principles of the C. M. P. have been adhered to without change. Under its workings during the last year, the increase in the production of end products was substantially greater than the corresponding increase in the controlled materials that were used as a basis for determining programs. The C. M. P. has been sufficiently flexible to handle the changing production requirements brought about by the developments of war. It has provided the requirements of our armed forces and its discipline has furnished the railways with reasonably liberal deliveries of materials and supplies.

The principal problem on many railways has involved teaching officers and employees of using departments how to requisition materials in an orderly manner rather than any failure of the C. M. P. from without. With approximately 500 W. P. B. orders now limiting or controlling the production of various materials, the entire situation has been reviewed by Washington authorities to determine which of these no longer will be needed after V-E Day. Specific orders have been listed for revocation after that day unless it is reasonably clear that their revocation would create difficulty in waging war in the Pacific area. Although 150 orders tentatively are scheduled for retention, W. P. B. has intimated that all will be revoked as soon as it is clear that they are no longer required. However, the C. M. P. will be abandoned in an orderly manner. The priority system will be overhauled with a quick revision to meet the transition period. It is anticipated that main priority instruments after V-E Day will comprise a single priority rating to serve almost exclusively for military procurement.

While the materials situation in general is easier than at any time in many months, shortages of some items still complicate matters, although not to the extent of tieing up needed locomotives or cars. Control measures are reported functioning smoothly in most instances with the greatest irritation coming from within railway organizations where still it is necessary to impress upon officers of using departments the necessity for requisitioning strictly in accordance with maintenance and construction plans based on allocations. Although 1944 saw sharp increases in railway inventories, and procurement officers generally are cautious against overstocking; most agree that heavy railway buying probably will continue through 1945.

Steel for War—and Railroads

Steel deliveries, at the year's end, had been forced into the tightest position in more than two months because of renewed pressure for more munitions. Bar schedules were particularly tight, with sheet and strip, shapes, plates and practically all finished steel products following in approximately that order. Orders, placed in the first part of December, for steel wheels were scheduled for delivery from the end of the first half to some time in the third quarter of 1945. Steel castings for locomotives also were giving some trouble but while the situation is quite general, practically all purchasing agents have emphasized the fact that in no instance had it been necessary to tie up locomotives because of the non-delivery of castings. Apart from this however, these items are critical in many areas, deliveries are slow and not much improvement is looked for in the near future.

These contentions are borne out by the fact that military commanders are exhorting industry to greater efforts to increase the production of shells of all calibre as well as small ammunition. More than twice the number of shells now are being used by our artillery in France than during comparable periods of World War I. The recent adaptation and use of "Time-on-Target" artillery

gunfire has so stepped up the use of shells that the rate of expenditure is almost unbelievable. The "T-O-T" system was invented by the British in the Western Desert and is now used exclusively by American artillery everywhere, with as many as 156 guns shelling one target simultaneously. It was only a short time ago that shell production in America was reduced but, with a reversal of policy and with the Allies basing their attacks on overwhelming superiority of men, materials, ammunition and all the implements of war, there does not seem to be much prospect for a change in the supply of railway steel castings until well along in 1945 at the earliest, even though victory in Europe may come early this year.

It is anticipated that the supply of controlled materials for domestic transportation for the first quarter of 1945 will be greater than allotments for the last quarter of 1944, but appreciably less than the amount requested by the Office of Defense Transportation. First quarter allotments include 1,254,838 short tons of carbon steel compared with requests amounting to 1,585,847 tons and fourth quarter 1944 allotments of 1,039,100 tons. Proportionate quantities of alloy steel, copper and aluminum also were authorized for the first quarter and additional reserves for railroad and local transit maintenance repair and operating supplies were set aside by the W. P. B. An allotment of 507,000 tons of carbon steel rails, representing the total available capacity, less military and export "must" requirements, was made against O. D. T.'s 600,000-ton request that represented the entire "controlled-cooled" capacity of the mills.

The W. P. B. also allocated enough materials for the delivery of 2,300 box cars in the second quarter of 1945, with the provision that railroads place their orders with car builders by December 1, 1944. The roads also were requested to place orders prior to January 1, 1945, for additional box cars for delivery in the third quarter, materials for which it is said, will be made available in time to complete the program.

Included in the allotment were 150,000 tons of carbon steel for automotive replacements (O. D. T.'s request was for 160,000 tons), the largest amount provided for this purpose since the outbreak of war. The W. P. B. also allotted material for the construction of passenger-train cars, chiefly day coaches and some baggage, mail and express cars. It is anticipated that these materials will be used to build 105 cars now on schedule and the remainder of the O. D. T.'s program of 250 such cars per quarter is scheduled to begin as soon as governmental authorities approve the man-power requirements.

Lead and Rope Supply

Lead was in such critical supply early in December that its allocation in the near future is possible, because lead consumption was exceeding production to such an extent that the government stockpile was being reduced below safe margins. At this writing proposed allocations are still in a discussion stage and no decision has been reached as to whether complete allocation is necessary although imports, it is announced, will continue to be stockpiled by the government.

Strenuous efforts are being made to increase the production of rope during the first quarter of this year, in order to help to meet the greatly expanded requirements of military claimant agencies. The W. P. B. declared, a short time ago, that stated military requirements for the first three months will exceed estimated production by several million pounds, because manila and sisal fiber imports have been eliminated by Japanese action. Railway requirements, in all probability, will continue to be filled for some time with rope made from jute and istle.

With military demands for petroleum in the East Coast states approximately 500,000 barrels per day greater than during the corresponding period a year ago, the Petroleum Administration for War has pointed out that should military demands for overland deliveries continue at present levels, a severe drain will be imposed on civilian supplies along the Atlantic Seaboard.

Expect Heavy Demand for Coal

The production of bituminous coal in 1944 is estimated to have reached an all-time high of approximately 620,000,000 tons compared with 589,000,000 tons produced in 1943. A large demand is expected for the first few months of this year, particularly if the war in Europe is prolonged. Many strip mines probably will be adversely affected by the tendency of winter weather to lower production, and consumers may attempt to hold storage stocks pending the expiration of the miners' wage agreement on March 31, 1945, just in case of some idle time at the mines until bargaining has been consummated and a new agreement has been reached.

Early in 1944 the O. P. A. started its adjustments of maximum price schedules in the various coal producing districts and raised the maximum prices for railroad fuel to the prevailing levels for commercial sizes. With the advent of spring, strip mines increased their production to such an extent that, by the end of the heating season, the railroads were able to begin replenishing their stockpiles, a procedure which continued until fall and resulted in a considerable increase in the ground storage of railroad coal. On November 1 railway storage stocks averaged 42 days' supply compared with an average of 25-day supply on April 1, 1944, and 35 days' supply on November 1, 1943.

Early in the fall, the Solids Fuels Administration began issuing directives to various mines for the production of coal suited to by-product uses, as a result a number of railways were so handicapped in procurements from their normal sources that they were required to go far afield in order to get sufficient fuel to protect their needs. This was true particularly in southwestern Virginia, district numbers 7 and 8, as well as in other districts to the north. The wave of optimism, that swept the country last autumn, and envisioned an early end of the European war, brought with it a slump in the demand for coal. Subsequently, as opinion changed, particularly after the withdrawal of the British paratroopers from Arnhem, the demand for bituminous coal strengthened. Lessening demands usually follow the close of lake navigation, but this already has been discounted and the demand probably will spurt with the approach of colder weather. Government directives, designed to supply coal for the armed forces, also had a pronounced effect on the sources of railway supply, and some procurement officers were faced with the difficult necessity of locating new supplies.

The coal situation in Canada, insofar as the railways were concerned during 1944, was much easier than the preceding year and the roads were enabled to maintain their stock positions without much difficulty. Quality was not up to standard but, in view of the general conditions, there was little cause for complaint. Comparatively few steam failures could be attributed directly to the use of inferior coal although prices, continued to increase throughout the year. Prospects for 1945 indicate that requirements will be met since procurement officers are of the opinion the traffic peak has been passed. Consumption in 1944 is estimated as slightly less than in 1943. It is estimated that, unless the war in Europe ends soon, 1945 consumption will be approximately 7,000,000 or 7,500,000 tons.

paging PAUL BUNYAN

Huge demands and falling production present forest product problems that would require all the invention of that giant lumberman of American folk-lore

Under the steadying influence of the War Production Board's Lumber Order L-335, the complete control and proper channeling of lumber have given the railways a working supply of the grades, species and sizes they need. Although rigid control and strict economy are in prospect for all of 1945, railway procurement officers in general are confident that essential lumber requirements will be filled as they were generally in 1944. Individual and sectional problems continue but, as a whole, the situation shows a marked improvement over the chaos that prevailed a year ago.

Crosstie supplies, with few exceptions, are adequate for 1945 insertion programs, but, railway procurement officers and tie producers are faced with a serious reduction in production. This has made itself manifest in no uncertain terms ever since last August. Generally, the outlook for 1946 supplies is poor.

By C. MILES BURPEE
Purchasing and Stores Department Editor

INSUFFICIENT and largely inefficient labor is the biggest "if" among the many "ifs" that now becloud the entire forest products situation. From the logging camps and mills of the Northwest, through the Inland Empire Region, the Southwest, the South, the East and generally throughout the tie production area of the Central, Southern and Eastern states, insufficient man-power probably will exert a greater influence than any other factor during 1945. Add to this the inadequacy of machinery repair parts and supplies, the steadily mounting difficulties encountered in making repairs to mill machinery and trucks, and the scarcity of heavy duty truck tires, and it is evident that mill men and producers are faced with a series of grave factors, several of which must be improved before any appreciable change for the better may be expected. Production still presents the gravest problem in all areas and probably will so continue throughout the greater part of this year.

Lumber Production Down

Lumber production for the first three-quarters of 1944 totaled 25,138,284,000 board feet, 3.3 per cent less than the production for the comparable period in 1943. The estimated lumber production in September was 2,731,863,000 board feet, a decline of 14.9 per cent from that of August and 10.2 per cent from production in September, 1943. The seriousness of this decline is reflected by the fact that the seasonal decline from August to September normally is about 5 per cent. Moreover, the sharp decrease in production from August to September of this year occurred in all major lumber producing regions, and was particularly marked in the Appalachians where the reduction amounted to 27.7 per cent, and in the South with a reduction of 18.9 per cent. In the Appalachian area labor and equipment shortages combined with heavy rainfall throughout the pine territory were the chief factors responsible for the reduction. The shortage of labor augmented particularly by the drain on woods labor for cotton harvesting and to a lesser extent from the cotton mills was the chief factor in reducing production in the South.

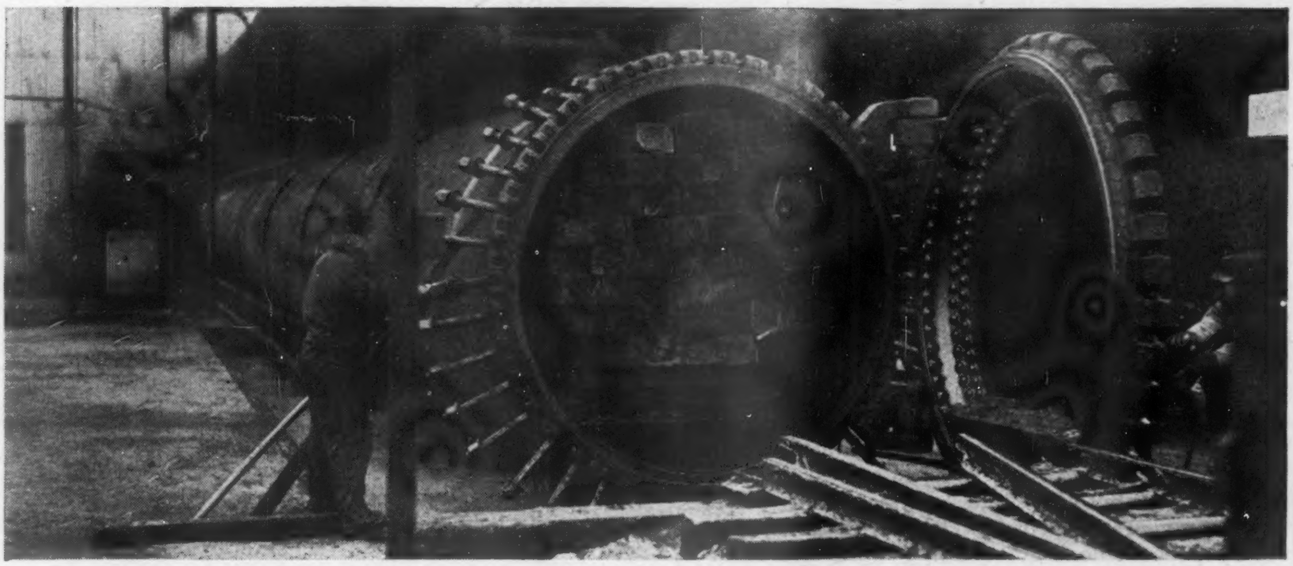
Douglas fir production in the North Pacific region was 11 per cent less in September than for August. Many logging operations in that region were closed for 10 days because dry weather aggravated fire hazards. September production in the East amounted to approximately 1,444,665,000 board feet or a drop of 17.8 per cent from August totals. The greatest decline in this region was in hardwoods which slumped 21.8 per cent and small mill production (under 5,000 board feet per day) amounted to only 75 per cent of the August cut. The total western production in September amounted to 1,287,198,000 board feet or a decrease of 11.2 per cent compared with August. September production of softwood showed a decrease of 11.7 per cent from September, 1943, and, hardwoods declined 4.8 per cent.

The Effectiveness of L-335

Lumber control has been largely responsible for the extensive salvaging of large quantities of lumber by the armed services during the last year. For instance, the War Department reported on September 30, that more than $1,000,000 of lumber had been reclaimed by the Transportation Corps, Army Service Forces, during the third quarter of 1944. Operated principally by Italian service units and German prisoners of war at the Transportation Corps' ports of embarkation and other installations, the salvage program mushroomed from a routine job to a conservation effort that is increasingly essential to war-time shipping. Every type of lumber from bomb racks and bulk heads on freight cars to dunnage is now going into the wood pile at port salvage yards where it is sorted for re-use.

Probably the most restraining influence of Lumber Control Order L-335 has been the effective control that has been established over the inventories of all Class I consumers, through inventory reports, requests for allocations, and the record of the quantities allotted. Under these circumstances it has been practically impossible to defeat the system, fudge reports and obtain unauthorized lumber consistently. The order has channeled lumber and made an equitable share available for railway use. At the same time it has been a big factor in cutting down unessential domestic uses.

Throughout the country railway procurement officers



Crosstie Supplies Generally Are Adequate for 1945, But Lagging Production Portends a 1946 Shortage

have a good word to say for L-335 and its achievements. For instance, a system purchasing agent of a road which uses approximately 15,000,000 board feet of lumber per quarter, declared that the control is working smoothly and that their greatest problem has been within their own organization, in endeavoring to impress upon their own men the necessity of ordering strictly in accordance with their plans for maintenance and construction and not to order excess quantities with the assumption that heavy cuts could be expected in final allotments. During the third quarter, 95 per cent of all the lumber ordered by that road for that period had been received and regular requests for the fourth quarter had been subject to a mere 10 per cent reduction, an overall situation which, in the opinion of that procurement officer, reflected the workings of a reasonable and efficient control system.

Order L-335 has the advantage that it may be modified from time to time by directions rather than revising or amending the order itself. In this respect, Direction Number 6 which allows the railways to buy from small mills without authority, has helped immeasurably in the production of switch ties, bridge timber and car lumber, thus tending to ease the general situation.

In other instances, railway procurement officers point to the fact that recent requisitions have been reaching their desks with many of the lumber items cancelled *en route*. This is further evidence of the controlling influence of the lumber order in helping to promote a wider utilization of the sizes, grades and species on hand. Another purchasing officer pointed out that railway requirements under Limitation Order L-218 and Control Order L-335, have been allotted according to individual needs based upon consumption and inventory. He added that experience with the procurement of lumber during the last year has been indicative of the proper consideration that at long last has been accorded to the importance of railway transportation.

Lumber authorized for distribution, in the first quarter of 1945, to claimant agencies and to industry divisions of the W. P. B. for reallotment to industrial consumers totalled 8,231,000,000 board feet, according to an announcement by the W. P. B. on November 30. Requirements for the quarter were estimated at 9,167,000,000 board feet and had to be reduced by reason of the estimated shrinkage in the supply, which for the quarter, is estimated to be 7,490,000,000 board feet, after deducting allowance for sawed crossties and without taking into account probable production loss due to the shortage of truck tires. The total allotment was set nearly 10 per cent higher than the supply because experience during the third quarter of 1944 indicated that, chiefly for administrative reasons, this proportion will not materialize in orders on suppliers and hence will be returned to W. P. B. reserve, a fact that has been borne out on several railways during the third quarter. The amount of lumber allocated for the first quarter of 1945 is 7.7 per cent less than that allocated for the fourth quarter of 1944, when 8,919,000,000 board feet were authorized. However, the estimated allocatable supply for the first quarter of the year is nearly 8 per cent less than the supply that was allocated for the fourth quarter of last year. Transportation allocations for the first quarter amount to 292,000,000 board feet.

Douglas Fir Tighter

The Douglas fir situation, at this writing, is tighter than it has been at any time in the last two years. Government demands tapered off materially last summer and during early fall, but with accelerated action in the Pacific, these demands have increased perceptibly since October 1, with the greater portion of this demand for cargo shipments. Clear lumber for car construction and repairs is becoming increasingly difficult to obtain in adequate quantities and for delivery within reasonable periods. Plywood mills have found it necessary to accept lower grade logs to meet the great demand for plywood. As a result, a greater proportion of inferior logs are left for the saw mills which in turn has brought a sharp reduction in the production of upper grades of lumber. The delivery of piles in the Northwest has been adversely affected by huge war needs for harbor installations and rehabilitation, as well as by labor conditions and, to a lesser degree, by the scarcity of truck tires.

Western pine has been almost an unknown quantity insofar as the railways are concerned, principally because of the heavy order files carried by the mills for boxing and crating lumber for military purposes. Labor shortage is the matter of greatest concern now confronting the logging and manufacturing interests in the Pacific

Northwest. Absenteeism and bad weather conditions in the woods add to the difficulties of winter production and grave doubts have been expressed as to whether there will be any general easing of the situation during 1945. Present indications are that while the overall war demands may decline somewhat after V-E Day, shipments from the West Coast to the Pacific theater will continue at high levels or even at an increased rate until the defeat of Japan. Since the Nipponese already have had an opportunity of learning object lessons from Germany in the destruction of European port facilities, it may be surmised that our conquest of the Philippines, and other territory now occupied by the Japs, may be attended by a large-scale rebuilding of port facilities, probably with lumber shipped from the West Coast.

Lumber manufacturers' problems in the South are largely of the same kind, with man-power still the principal trouble. There is probably not an operator in the South that has a full crew of men at work in the woods and at the mill simultaneously. The scarcity of repair parts for machinery and trucks and the scarcity of heavy-duty truck tires also add to the producer's difficulties. At this writing, the Southern pine market is strong and is dominated by an insistent demand for practically all grades that can be manufactured. The principal demand is still for boards; dimension and timbers are moving readily, with most of the production going directly or indirectly to war-time uses. Although there has been a falling off in orders, this is presumed to reflect unwillingness on the part of the mills to load up with additional business rather than any actual slackening of the demand.

Hardwood is scarce and practically anything can be sold except the lowest grades and the thicker sizes of the less desirable species. Upper grades seem to be scarcer than ever; even the accumulations of low grade stocks at many of the smaller mills appear to be moving. The producer's principal cause for concern has been the inability to accumulate a supply of logs during good weather because of the scarcity of labor. As a result, hardwood mills have gone into the winter without their customary big piles of logs and the outlook is not promising.

Enough Ties for 1945—Later Outlook Poor

For the most part railway crosstie stocks and inventories being held on producers' yards for delivery on specific railway orders are sufficient to insure an adequate supply of crossties for renewal purposes during 1945. There are some exceptions in various territories and from the present outlook, some railways will begin to feel the pinch rather severely by mid-summer; but, for the most part, available stocks of cross and switch ties will be sufficient to meet the maintenance departments' most optimistic programs, unless for some unforeseen reason there is a windfall in the way of an abundance of track labor. Generally, the switch tie situation is much easier than that of crossties.

Falling production is now one of the most disconcerting factors in the whole situation. With an almost imperceptible general decrease, beginning about mid-year, production continued to slump in practically all territories throughout the Midwest, the South, the Southwest and the East. By August the slump became quite manifest and it has persisted. Reports from various sections indicate that, as this is being written, production ranges anywhere from 35 to 40 per cent less than last year. In some localities the drop has been even greater, for, in some sections of Texas and the deep South, present production is running approximately 55 per cent of that for the same period of 1943.

Railway procurement officers and tie producers as well are voicing fears regarding crosstie supply for 1946. They point to the drastic curtailment in production as well as the fact that the 1944 production curve is well below that of 1941, 1942, and the last half of 1943. Crosstie production by mid-December was probably at lower ebb than at any time during the last ten years. Even some of the railways that previously had been protected by long-range purchasing policies now are beginning to be alarmed. For instance, one of the large systems which has sufficient ties in stock for 1945 installations, has been experiencing for some months, a reduction of from 35 to 40 per cent in the production of crossties along its lines and throughout the production areas from which its ties are procured. Every railway now buying in these localities is exerting every effort to bring in as many crossties as possible without much regard for requirements in the immediate future. The scramble that has been witnessed in retail markets for non-durable goods is being reenacted among some railroads in their scramble for crossties.

In order to offset unsatisfactory deliveries, many of the roads have resorted to the use of a great many more pine, gum and miscellaneous hardwood crossties, (which formerly were not acceptable) for the reason that many of these season faster and are available anywhere from four to six months sooner for preservative treatment and insertion in track.

Why Crosstie Production Has Slumped

Inadequate and inefficient labor, competition from war plants, cotton picking throughout the South, high prices for favorable crop yields, and the inadequacy of transportation from the woods to the concentration yards, brought about principally through the lack of adequate trucks, and the shortage of truck tires, are the factors largely responsible for the sharp drop in current tie production. In addition to the loss of labor to war industries in nearby areas, labor has been solicited from the woods and the mills of the Central, Southern and Southwestern states for war work on the West Coast at unusually attractive wages and improved living conditions compared with the wages that the tie producers are allowed to pay. In some territories of the Southwest, it has been reported that trucks with loud speakers were being used to canvass the small towns and rural communities urging men to leave those sections for war plant work on the Pacific Coast.

About the time that the cotton harvest in the South began drawing woodsmen to the more lucrative employment of cotton picking at $4.00 per 100 lb., and good crops in most areas brought more money to the farmers, and tie hewers, the more serious reduction in crosstie production began to manifest itself. Up to this time there were several railways that had been considering tightening up their specifications, to eliminate the stocking of smaller crossties, and reverting to their normal buying practices. In other instances railways disposed of quantities of sizes 1, 2 and 3 ties which they had amassed in the course of several months of buying. Worried about the considerable drop in production during the past quarter, these same roads look forward with apprehension to the 1946 supply. In order to stock as many ties as possible, they still are taking less desirable species and a comparatively large portion of their crossties in the smaller sizes in efforts to circumvent as much as possible

(Continued on page 33)

maintenance OUTLAY *at new high*

Dollar value of expenditures reaches new record in 1944, but tracks and structures barely hold their own. Construction activity continues at moderate level

By MERWIN H. DICK
Western Engineering Editor

THROUGHOUT 1944 the railroads continued the up-hill struggle to keep their fixed properties in a condition adequate to carry a burden of traffic that gave little indication of relenting, but as the year drew to a close the feeling was prevalent that the struggle was going to be won, although it was equally evident that the margin of safety would be narrow indeed. For three years those responsible for the maintenance of way and structures have labored under a cloud of uncertainty regarding their ability to overcome the obstacles confronting them, but now the cloud has begun to lift somewhat, giving rise to the feeling that they will be able to carry on through the worst that may yet be offered. In fact, having successfully dealt with the many war-time problems imposed on them—problems that at times seem well-nigh insurmountable—and while still immersed in those problems, construction and maintenance officers are beginning more and more to think in terms of the future and its implications for them and their departments.

The outstanding development of the year in the field of maintenance of way and structures was a further rise in expenditures to a new all-time high. Based on official figures for the first nine months, it is estimated that total expenditures of the Class I railways for maintenance of way and structures for the entire year will amount approximately to $1,330,000,000. Without regard to underlying factors, this figure is impressive indeed. It is $222,000,000, or 20 per cent, higher than the comparable figure for 1943 which was the previous record. It is nearly three times the expenditures for 1939, and is slightly more than four times the amount that was spent for this purpose in 1933, in the trough of the depression period. The expenditures for 1944 even far out-stripped those of the "boom" period of the 'twenties, being about one and one-half times the average annual expenditures for the period from 1925 to 1929, inclusive.

One of the tables shows the annual expenditures for maintenance of way and structures of the Class I railroads for the 11 years ending with 1943, the latest year for which official figures are available, as well as the average annual expenditures for the period 1925-29. This table also includes figures showing the manner in which the total expenditures for each year were distributed among the various primary accounts.

As a measure of the amount of work actually per-

Mechanization of Track Maintenance Operations Was an Important Factor in Aiding the Railroads to Carry Out Extensive Work Programs in 1944

In the Interest of Greater Efficiency Many Engine Terminals Will Be Revamped and Modernized

Expenditures of Class I railways for the maintenance of way and structures last year are estimated to total about $1,330,000,000, an increase of 20 per cent over 1943, and a new high record. However, because of many factors tending to inflate unit costs, the amount of constructive work actually accomplished was far less than indicated by this figure. The implications of this development, together with other aspects of the present picture regarding maintenance and construction activities, are discussed in this article.

formed on the tracks and structures in relationship to that of previous years, the figure for 1944 is somewhat misleading. This is so because many influences were at work which, collectively, had the effect of materially reducing the effectiveness of the maintenance dollar; that is, of bringing about a reduction in the units of work performed per dollar expended. These influences were entirely beyond the control of maintenance of way officers, and, in view of the many inflationary aspects in the situation, the surprising thing is that so much effective and constructive work was accomplished with the dollars expended, this being attributable in large measure to the extensive and increasing application of mechanized equipment to maintenance tasks.

Among the factors that tended to increase the unit costs for maintenance in 1944, and thereby to require the expenditure of larger sums than previously in order to accomplish a given amount of work, were the

Expenditures for Maintenance of Way and Structures, Class I Railways

(Thousands)

	Average 1925-1929 (Inclusive)	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943
Superintendence	$57,262	$31,921	$33,347	$35,605	$37,357	$39,801	$38,935	$39,072	$40,231	$43,407	$49,461	$57,592
Roadway Maintenance	83,698	30,026	30,714	35,809	38,289	42,017	37,219	36,112	38,372	47,923	69,701	110,764
Tunnels	2,608	933	1,051	1,453	1,326	1,709	1,256	1,210	1,374	1,780	4,529	3,668
Bridges, culverts, etc.	43,471	17,627	20,139	22,646	24,032	26,268	24,200	24,782	26,514	31,754	40,801	44,356
Ties	114,859	43,543	50,748	51,936	56,315	59,799	53,762	59,910	58,353	64,928	75,141	84,982
Rails	47,402	14,324	15,418	16,302	21,192	20,412	17,406	22,065	22,736	24,684	25,199	33,146
Other Track Materials	48,354	15,362	18,694	20,959	26,732	30,228	22,817	29,670	33,428	38,711	40,091	50,541
Ballast	19,379	5,814	7,538	8,357	11,992	12,362	7,744	10,343	11,592	15,093	20,107	25,168
Track Laying and Surfacing	211,067	77,025	85,641	94,033	106,072	121,113	103,420	114,932	117,839	156,142	212,594	289,636
Fences and Snow Sheds	5,831	2,047	2,412	2,260	†3,397	†3,689	†2,939	†3,235	†3,408	†3,930	†4,031	†5,877
Crossings and Signs	13,115	5,969	7,293	7,186	*	*	*	*	*	*	*	*
Buildings	79,000	24,576	31,448	33,047	41,252	47,757	34,315	41,018	46,852	60,412	80,663	102,680
Water Supply	10,444	3,749	4,441	4,497	5,860	6,182	4,672	5,207	6,020	6,736	8,561	9,680
Tools and Equipment	18,230	8,051	10,666	11,044	13,452	15,408	11,456	13,720	15,434	18,971	20,892	23,397
Injuries	5,907	2,417	2,810	2,727	3,118	3,303	2,806	2,929	3,220	3,547	4,642	5,903
Removing Snow, Ice and Sand	9,947	4,188	5,630	7,001	13,365	6,655	5,239	6,110	9,030	5,995	8,739	12,798
Miscellaneous	78,449	34,714	37,310	39,105	51,059	58,891	51,961	56,516	29,202	79,076	131,206	248,093
	$849,021	$322,286	$365,300	$393,967	$454,810	$495,594	$420,147	$466,831	$497,031	$603,088	$796,358	$1,108,281

Note: Miscellaneous includes such items as signals and interlocking, depreciation, deferred maintenance and unclassified charges.
* Not shown separately since 1935.
† Includes signs, as well as fences and snow sheds.

higher wage rates prevailing; the larger amount of work that was done at over-time rates; the generally increased cost of materials; the greater loss of productive time due to the higher train density prevailing; the necessity of using inexperienced or inefficient labor in large amounts; and the effects of uncertain or irregular deliveries of materials. It is not possible to place an accurate evaluation on the over-all effects of these influences but it is known that the unit costs of performing certain important categories of work are, in some instances, more than 100 per cent greater than four years ago and more than 300 per cent greater than during the depression.

Assuming that the quantities of rail and ties inserted in renewals constitute an approximate criteria of the total amount of maintenance work performed, it is possible to relate these to the total dollar expenditures for maintenance of way and structures, and thereby to convey some idea of the present discrepancy between the dollars expended and the actual amount of work accomplished. To do this the quantities for 1929 were taken as 100 and the fluctuations from that level in rail and tie renewals, and in total expenditures for maintenance of way and structures, were plotted on a single chart which is presented with this article.

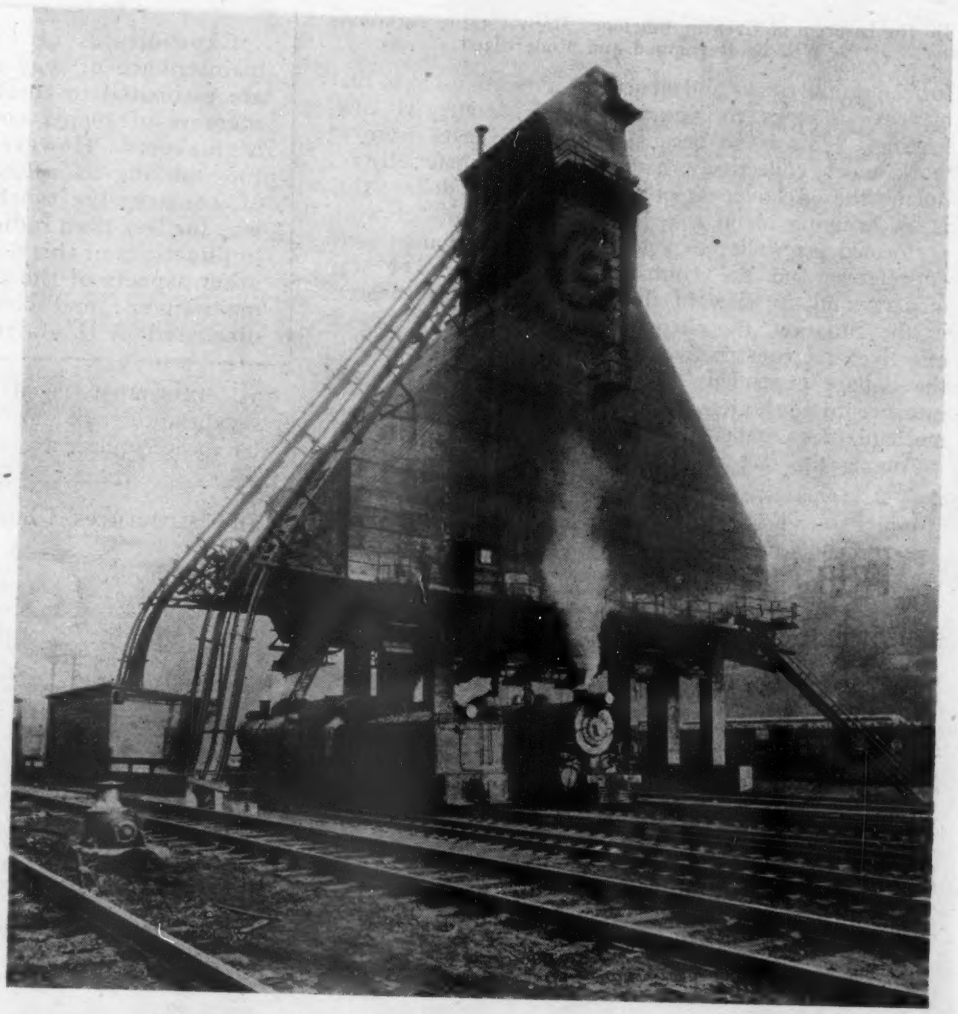
Taking into consideration all the factors tending to increase the cost and to reduce the efficiency of maintenance activities, and keeping in mind that the tracks and structures were subjected during the year to a traffic load that broke all previous records, the general impression among maintenance officers is that, notwithstanding the high dollar value of the expenditures for maintenance in 1944, the actual amount of work done was no more than barely sufficient to keep the tracks and structures from deteriorating.

Bearing also in mind the fact that the year under review was preceded by two war years in which the fixed properties lost ground due to a combination of heavy traffic and a lack of sufficient man-power and materials for adequate maintenance, and that, prior to the war, there was nearly a decade of under maintenance, it is apparent that there is little cause for an attitude of complacency regarding the condition of the properties. Only a continuance of the present strenuous efforts, combined with adequate supplies of rail, ties and other essential materials, will see them through the remainder of the war without further deterioration, and it is only too readily apparent that, with the war still in a critical phase, any appreciable reduction of these efforts, or in essential materials and supplies, could have disastrous results.

Rail Deficiency Grows

Because the life of rail is to a large extent directly proportional, in inverse ratio, to the amount of traffic moving over it, this important component of the track structure continues to hold the spotlight in the minds of those who are concerned with the integrity of that structure. That their concern on this score is entirely justified is indicated by the fact that at no time since the war started have they been able to obtain what were estimated to be their minimum requirements for rail, taking into consideration the unprecedented rate at which rail is being worn out because of the record traffic load that is now being imposed on it. For 1942, the first full year of our participation in the war, the amount of rail received by the railroads was 27 per cent under their estimated minimum requirements; in 1943 the deficiency was about 29 per cent. For the two years the total quantity of rail received was close to a million tons short of the minimum requirements.

In the meantime, evidence was growing to substantiate the contention of the railroads that the critical condition of their rail was not a figment of imagination but a threatening reality, with the result that it began to appear late in 1943 that their needs in this respect were finally to be recognized. It was estimated at that time by the railroads that their minimum requirements for rail in 1944 would be nearly 2,600,000 net tons. The Office of



Engine Servicing Facilities Will Come in for a Great Deal of Attention in the Post-War Period

Defense Transportation request to the War Production Board was for 2,200,000 tons, and as late as April 20, 1944, it was estimated by the associate director of the O. D. T. that, barring a shortage of man-power at the steel mills, the railroads should receive the full amount of rail requested by the O. D. T.

Based on the amount of rail actually received during the first two quarters of the year, it appeared that this prediction was in a fair way to being fulfilled. These quantities were 525,500 net tons and 550,000 tons for the first and second quarters, respectively. However, the amount received in the third quarter dropped sharply to slightly less than 400,000 tons, and was approximately the same in the fourth quarter. Among other things, this slump was explained by the fact that mill capacity was needed for the production of plates and shells, and by the further fact that a considerable amount of new rail was being shipped overseas for use in reconstructing devastated lines in reconquered territories. Thus, the total amount of rail received in 1944 was only 1,874,000 net tons, or 726,000 tons less than the quantity that was fixed as the minimum amount needed.

Prospects for 1945

For 1945 the roads have estimated that they will need approximately 2,900,000 net tons of rail, but present indications are that they will fall considerably short of receiving this quantity. The amount requested by the O. D. T. for the first quarter was 600,000 tons, but the W. P. B. has allocated only 507,000 tons, explaining that this tonnage would represent the "total available capacity, less military and export 'must' requirements."

In an accompanying table figures are given showing the number of gross tons of new rail applied in renewals by the Class I railroads for each year since 1925. The amount given for 1944, which is 1,570,000 gross tons (1,760,000 net tons), is based on figures supplied by practically all Class I railroads, giving the tonnages of new rail installed by each of them for renewal purposes during the year. This is the largest amount of rail that the roads have laid in any year since 1929, when they inserted 1,958,489 gross tons (2,190,000 net tons). However, since the adequacy of rail renewals can be determined only in the light of their relationship to the traffic carried, it may be well to make a comparison on this basis.

For the ten-year period ending with 1931 the railroads laid an annual average of 1.55 gross tons of new rail per million gross ton-miles of freight traffic carried. For the ten-year period ending with 1941—a period that was characterized by extensive under-maintenance of the tracks and structures due to an insufficiency of funds for this purpose—the railroads laid an average of 0.79 tons of new rail each year per million gross ton-miles of freight traffic. During the war years there has been no appreciable improvement in this relationship, the figure for 1944 being 0.82 tons of rail laid per million gross ton-miles of freight traffic. Even when due consideration is given the extent to which the life of rail has been increased in recent years by various expedients, it is evident that the present amount being laid is still considerably below the requirements. To put it briefly, there are few aspects of the present situation regarding rail from which comfort can be drawn by those responsible for its integrity, and certainly there is nothing in the situation to justify an attitude of complacency in any quarter.

Rail Applied in Renewals—Class I Roads

	Gross Tons		Gross Tons
1925	1,950,146	1935	582,794
1926	2,209,873	1936	921,298
1927	2,124,765	1937	1,029,861
1928	2,080,277	1938	599,752
1929	1,958,489	1939	878,643
1930	1,517,002	1940	998,914
1931	984,900	1941	1,197,593
1932	394,536	1942	1,192,225
1933	403,254	1943	1,262,547
1934	631,093	1944	1,570,000*

* Estimated.

Crossties Applied in Renewals—Class I Roads

1925	82,716,674	1935	44,351,900
1926	80,745,509	1936	47,361,015
1927	78,340,182	1937	47,729,538
1928	77,370,491	1938	41,363,224
1929	74,679,375	1939	45,088,278
1930	63,353,828	1940	43,620,653
1931	51,501,659	1941	47,224,593
1932	39,190,473	1942	48,616,228
1933	37,295,716	1943	45,439,512
1934	43,306,205	1944	48,500,000*

* Estimated.

Line Improvement and Curve-Reduction Projects Will Require the Use of Off-Track Grading Equipment in Large Quantities

Tie Renewals Higher, But—

During the war years the crosstie situation has also been a source of considerable concern. One of the tables gives the number of crossties that the Class I railroads have inserted in renewals in each year since 1925, the figure for 1944 being a computation based on estimates supplied by the Class I roads. This table shows that the tie renewals for 1944 amounted approximately to 48,500,000 crossties, which was an increase of 3,060,500 crossties, or 6.7 per cent, as compared with 1943. Also, except for 1942, the tie renewals for 1944 were the largest for any year since 1931. However, here again, it may be questioned seriously whether present crosstie renewals are sufficient to compensate for the increased rate at which ties are being worn out under the impact of present-day traffic.

Generally speaking, the railroads have not been able to insert as many ties during the war period as they have felt were necessary to prevent deterioration of the overall condition of their ties. On some roads this has been due to their inability to obtain sufficient quantities of ties, while on others the lack of labor for making tie renewals has been the limiting factor. In general, it may be said that in 1944 the roads were able to obtain as many ties as it was possible for them to insert, although there were individual railroads on which tie renewals were lim-

Modern, Attractive Stations Will Constitute an Important Means of Inviting and Holding Passenger Business

ited by their inability to obtain as many as could be applied.

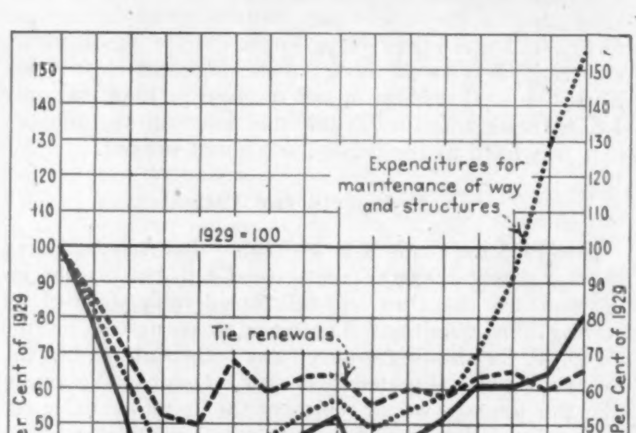
Regarding the prospects for maintenance of way activity in general in 1945, every indication points to a continuance of at least the present rate of activity throughout the year. Obviously, these prospects will depend somewhat on the trend of the war, but even though the conflict in Europe should end suddenly, the Japanese phase may persist for some time, and this factor, combined with the rising rate of civilian production that is certain to take place, is expected to hold traffic at or near its present level. If this proves to be the case, there can be little or no relaxation of the present efforts of maintenance of way forces. Nor is it expected, in general, that the man-power situation will show any great improvement, although it is reasonable to assume that there may be changes for the better in the situation governing the availability of critical materials.

Despite their absorption in current problems, maintenance officers are giving increasing attention to the situation that will confront them when peace comes, with all its implications in the form of increased competition in the transport field and the consequent necessity of maintaining the tracks and structures to a standard commensurate with the higher train speeds and increased comfort and safety for passengers that are expected to be the order of the day. Their concern in this respect arises partly from a keen appreciation of the fact that in many respects the properties are in a greatly deteriorated condition, and that it will be necessary to overcome this situation before any progress can be made in the direction of incorporating necessary improvements.

Another cause for concern is the present inflation in the unit costs of performing maintenance work, and the necessity of effecting substantial reductions as soon as practicable. To put it another way, maintenance officers realize that, in the period of intense competition that is expected to follow the coming of peace, they will find it incumbent upon them to maintain their properties to a higher standard than ever before, while keeping expenditures to a minimum. Thus a problem will be posed whose solution will require all the skill and ingenuity at their command.

Improvements Follow Same Pattern

With respect to construction work involving additions and betterments, the year 1944 was in many respects a repetition of the previous year as regards both the nature of the work carried out and the difficulties encountered. For many years prior to the war construction activity was held at a low level because of an insufficiency of funds for such work, with the result that most railroads entered the war with a considerable back-log of projects, most of them long overdue. Following the outbreak of war, railroad earnings increased rapidly, but because of material priorities and government restrictions on construction work, the types of improvement projects which the railroads were permitted to undertake were generally limited to those that had a direct bearing on their ability to handle war traffic.



By Showing Tie and Rail Renewals and Expenditures for Maintenance of Way and Structures in Recent Years in Terms of Their Values for 1929, This Chart Illustrates the Manner in Which Expenditures During the War Years Have Out-Distanced the Actual Amount of Work Accomplished

In 1943, the latest year for which figures are available, the railroads spent a total of $454,282,000 for additions and betterments (not net additions), and it is reasonable to assume that construction activity was maintained at about the same rate through 1944. While this level of activity is considerably higher than that which prevailed during the 'thirties, the average annual expenditure during the 11-year period ending with 1941 being only $159,833,636, it is still far short of the level attained during the immediate pre-depression period, which averaged $801,926,000 annually for the five years ending with 1930.

Because of the special nature of many of the projects carried out during the war years, very little progress has been made in reducing the back-log of improvement work that existed at the time war broke out. As a matter of fact, it is more likely that this back-log has shown a substantial increase because of the many additional facilities that have become obsolete or have reached the end of their service life during the war years. Furthermore there is no question that competitive factors in

the post-war period will force upon the railroads the necessity of making many improvements of a diverse nature designed to render their service more attractive to both the shipping and traveling public, ranging from the reduction of curvature to the modernization of passenger stations. Also, since the necessity for achieving maximum operating efficiency will be a compelling factor in the post-war period, the railroads are expected to undertake many projects designed to accomplish this end, such as the modernization of engine terminals and of intermediate locomotive servicing facilities through the provision of more up-to-date plants for supplying them with coal, sand and water. In this connection, because of the increasing use of Diesel-electric power, the railroads are certain to find it necessary to carry out projects on an extensive scale for the provision of facilities for repairing, maintaining and servicing such power.

Station Modernization a "Must"

Among all the types of projects now being given consideration for the post-war era is one category that deserves special mention, namely, the modernization of railroad passenger stations. Before the outbreak of the war forced the railroads greatly to curtail activities of this nature, a considerable amount of such work had been done but this was relatively insignificant compared with what will be necessary after the war if the railroads are to keep their stations in harmony with the modern types of passenger equipment that are certain to make their appearance on an extensive scale. As a means of promoting good will, nothing is more effective than passenger stations that represent the last word in modern design, materials and fixtures, and in the minds of many travelers the comparison between railroad service and that of their competitors will be conditioned to a large extent by the relative attractiveness of their respective station facilities.

In bringing their passenger-handling facilities up to date the railroads will not find the necessary materials lacking, for the manufacturers have been alert to the possibilities in this respect and are prepared to furnish a wide variety of exterior and interior finishing materials in a range of colors and designs. Through the proper application of such materials it should be a relatively simple matter to convert any obsolete and out-moded railroad passenger station into an attractive, modern facility capable of holding its own in comparison with the best that can be offered by competitive agencies.

It is generally recognized that there must be a large amount of construction activity in the post-war period if all available workers are to be given employment. Under any circumstances the railroads will assume a large share of this responsibility. But the contribution that they will be able to make in this respect will be dependent to a considerable degree on whether and to what extent they are given the opportunity of competing on an equal basis with other transport agencies.

Paul Bunyan

(*Continued from page 27*)

the low volume production which they foresee in 1945.

With man-power shortage in the woods, at the sawmills and wood preserving plants, the handling of crossties from trucks to seasoning yards or to cars or trams long has been one of the great headaches of the industry. That this headache has been passed on to the railways in the form of increased prices is evident in many respects. The problem has reached such an acute stage that good tie handlers, that is the men who can shoulder a size five crosstie and walk off with it as their regular work for six to eight hours a day, have been reported as earning up to $18, $20 and even $35 a day on a piece-work basis. It has been due largely to the increased cost of labor for instance that the average cost of railway ties has risen as much as 75 cents per tie.

Progress in Mechanical Handling Methods

It has been under circumstances of this kind that, particularly during 1944, added interest has been aroused in the development of feasible mechanical methods for handling crossties. It is quite apparent to the industry and to the railways as well that the numbers of old-time type tie handlers simply have not been developed during the last several years. Many reasons may be ascribed for this and probably among others is the fact that during the last twenty years the size and weight of crossties have increased appreciably. Not only are the railways using much larger proportions of sizes four and five ties but they also are using larger proportions of 8 ft. 6 in. ties. Furthermore, the use of 9 ft. crossties, heralded a few years ago as an important development in helping to provide more stable track for higher speeds, is spreading. Another of the large rail systems recently decided to use longer ties in main line tracks and some 60,000 7 in. by 9 in. by 9 ft. crossties will be produced in 1945 for use during 1946.

In addition to the fact that the American Wood-Preservers' Association has been approached with regard to investigating and setting up proposed methods of developing mechanical tie handling, several independent ventures have made progress during the last year. Among those that have been reported as most successful, is an unloading device, developed by one of the creosoting companies, which is particularly adapted for unloading crossties from cars at a rate of approximately 12 ties a minute, better than the average unloading can be done by hand.

In other instances, unloading attachments have been developed for use in conjunction with cranes to solve part of the problem, but much remains to be accomplished in the way of transporting the ties from the cars, stacking them on the seasoning yards and then in turn transferring them again to the trams for treatment after the seasoning period.

One School of Thought

Another of the interesting developments involves the use of tractor-type lifting trucks capable of handling blocks of ties and stocking them four tiers high on the seasoning yards. Preliminary trials indicated the practicability of this method even though difficulties were encountered by reason of the fact that the machines, not designed for this purpose, did not have the requisite bearing in moving over the surface of the seasoning yards.

One school of thought believes that the solution of the tie handling problem lies in the co-operative effort of the railways, producers and treating plants and urges a pooling of resources committed to the mechanization of one of the most troublesome aspects of tie production and treatment. It may be that the steps that already have been undertaken during 1944 will be preliminary to ways and means of simplifying and reducing the cost of handling crossties in the various stages of their production and treatment.

intensive freight CAR USE *in 1944*

Supply of cars must be appreciably augmented by new equipment in the coming year if present transportation service records are expected to be maintained

By *E. L. WOODWARD*
Western Mechanical Editor

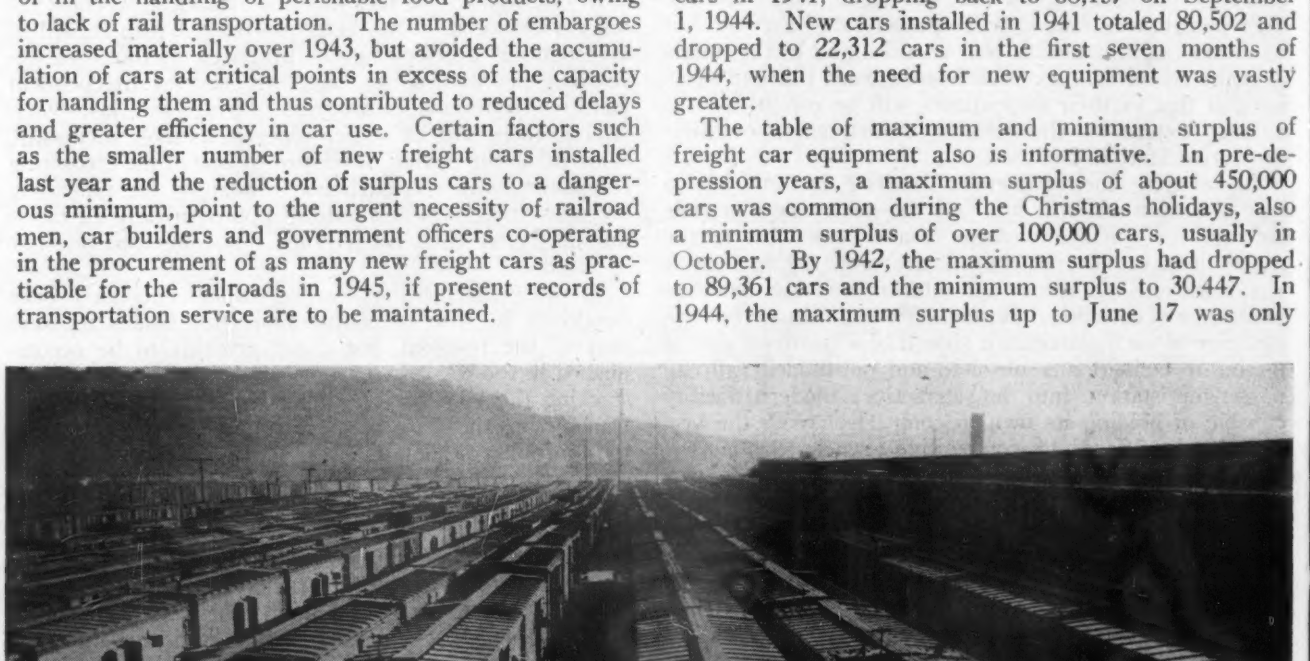
As pointed out in a recent report of the A. A. R. Car Service Division, railroads handled in 1944 about 2½ times the amount of freight traffic which they moved before the war and practically double the load of the first World War, with 25 per cent or 600,000 fewer freight cars. In the first six months of last year, as compared with the first six months of 1939, for example, revenue ton-miles increased 153.4 per cent; tons handled increased 114.5 per cent; and export freight increased 223.2 per cent. As a result of sustained emphasis on heavy loading, the average load per car was kept near the peak figure of 40 tons; freight train speed continued at the high average level of 15.7 miles an hour; and daily car-mileage reached what appears to be an all-time record of close to 50 miles per car per day.

This intensity of car use, so essential to the successful prosecution of the war, was accomplished without serious car shortages and loss of production at defense plants or in the handling of perishable food products, owing to lack of rail transportation. The number of embargoes increased materially over 1943, but avoided the accumulation of cars at critical points in excess of the capacity for handling them and thus contributed to reduced delays and greater efficiency in car use. Certain factors such as the smaller number of new freight cars installed last year and the reduction of surplus cars to a dangerous minimum, point to the urgent necessity of railroad men, car builders and government officers co-operating in the procurement of as many new freight cars as practicable for the railroads in 1945, if present records of transportation service are to be maintained.

The need for further strenuous efforts to secure maximum use of present freight car equipment, as well as to install a sizeable volume of new cars, is amply demonstrated by statistics in the accompanying tables which are based on information supplied to the Car Service Division by transportation and mechanical officers of individual Class I railroads.

Referring to the table, equipment on order and placed in service by Class I roads and railroad-owned refrigerator companies, as of September 1 of each year, the substantial drop in car ownership of nearly 25 per cent from 1927 to date is shown. Orders for new cars reached a minimum of 1,129 in the depression year of 1933 and, with some variations, were built up to 92,033 cars in 1941, dropping back to 36,157 on September 1, 1944. New cars installed in 1941 totaled 80,502 and dropped to 22,312 cars in the first seven months of 1944, when the need for new equipment was vastly greater.

The table of maximum and minimum surplus of freight car equipment also is informative. In pre-depression years, a maximum surplus of about 450,000 cars was common during the Christmas holidays, also a minimum surplus of over 100,000 cars, usually in October. By 1942, the maximum surplus had dropped to 89,361 cars and the minimum surplus to 30,447. In 1944, the maximum surplus up to June 17 was only



Comparing 1944 with Pre-War:	Percent
Revenue ton-miles increased	153.4
Tons handled increased	114.5
Export freight increased	223.2
Average load per car increased	7.9
Train speed increased over 1943	1.9
Miles per car per day increased	54.5
Freight car ownership *decreased*	25.0
New cars installed *decreased*	56.3
Surplus cars *decreased*	87.1
Cars over 25 years old	30.7

about 29,000 cars and the minimum surplus, up to September 30, 8,444 cars, or a reserve of very doubtful and inadequate cushioning capacity.

Scanning the table of freight cars held for repairs indicates clearly the effect of general business conditions upon railroad policy as regards freight car maintenance. In times of depression, railroads do not need as many cars; neither do they have the funds to repair them. Consequently, the number of cars awaiting repairs reached a peak of 304,202, or 14.9 per cent of the total ownership, in the depression year of 1933. The table shows how these figures progressively declined to 48,720 or 2.8 per cent in 1943 and then increased slightly to 51,946 or 3.0 per cent on June 1, 1944. This does not necessarily indicate a good mechanical condition of freight car equipment, but simply evidences the drastic steps taken by railroads to make necessary light or running repairs and keep just as many cars as possible in revenue service.

The brief table showing the age of freight-carrying cars on Class I railroads presents figures supplied by the American Railway Car Institute and is significant because it discloses the fact that only about 14 per cent of the freight car inventory is less than five years old and nearly one-third is over 25 years old. No further comment is necessary, bearing on the need for replacing present obsolete freight car equipment just as fast as possible from the standpoint of economic practicability and the release of necessary materials and man-power to car building plants.

Freight Cars on Order and Placed in Service; Class I Roads and Railroad-Owned Refrigerator Car Lines

Year	Freight cars owned September 1	Cars on order September 1	New cars put in service
1944	1,843,365	36,157	22,312*
1943	1,831,701	28,433	28,708
1942	1,826,214	35,063	63,009
1941	1,759,667	92,033	80,502
1940	1,730,227	18,456	65,545
1939	1,736,929	8,779	24,528
1938	1,787,931	8,892	18,517
1937	1,819,495	31,419	75,058
1936	1,851,142	22,354	43,941
1935	1,944,543	7,240	8,903
1934	2,040,446	8,372	24,103
1933	2,156,515	1,129	1,879
1932	2,245,759	1,423	2,968
1931	2,316,065	6,643	12,662
1930	2,369,178	12,166	76,909
1929	2,361,638	31,898	84,894
1928	2,392,267	9,257	58,395
1927	2,419,802	18,764	75,386

* January 1 to August 31.

Maximum and Minimum Surplus of Freight Car Equipment

Year	Maximum number of cars	Date	Minimum number of cars	Date
1944 to	28,998	June 17	8,444	September 30
1943	81,512	June 5	13,570	October 23
1942	89,361	January 3	30,447	October 31
1941	193,344	April 22	38,511	October 4
1940	190,370	March 14	72,101	October 7
1939	265,414	April 30	64,299	October 14
1938	329,023	June 14	139,436	October 14
1937	283,248	December 31	101,630	October 14
1936	251,079	January 14	112,369	October 31
1935	376,575	January 14	208,158	October 31
1934	435,819	January 14	317,525	September 30
1933	691,587	January 31	385,137	October 31
1932	772,565	June 30	545,157	October 31
1931	750,696	December 31	532,301	October 22
1930	706,538	December 31	373,825	February 7
1929	447,141	December 31	107,301	October 14
1928	461,669	January 7	85,825	October 14
1927	464,005	December 31	135,059	September 30

More Box Cars Primary Requirement

The situation as regards box car supply was tight throughout the country during 1944, particularly as regards first-class cars and special types of box cars suitable for loading both military and commercial commodities, such as motor vehicles, munitions, food products, lumber, grains, etc. This condition existed in spite of numerous government orders promoting the more efficient use and heavier loading of cars, and was augmented by the fact that only 7,824 new box cars were added to the total box car ownership during the first nine months of 1944, and the number of serviceable box cars on September 1 was 7,679 less than on September 1, 1943.

Ventilated box cars again were provided to handle an increased loading of vegetables and watermelons from the Southeast without serious difficulty, although the number of cars available for this service was substantially less than in previous years and it was necessary temporarily to confine the use of ventilated box cars to vegetable and watermelon service. The production of military vehicles in enormous quantities last year maintained the heavy demand for 50-ft. automobile box cars equipped with the loading device and both 40 and 50-ft. cars having full end doors and wide staggered side doors. This demand will apparently continue during the present year and require special efforts on the part of railroads and military, as well as civilian, shippers in order to protect the service.

Freight Cars Awaiting Repairs as of September 1

Year	Number of cars	Per cent of total
1944	51,946	3.0
1943	48,720	2.8
1942	53,238	3.1
1941	78,044	4.7
1940	137,869	8.6
1939	224,603	13.8
1938	238,433	14.2
1937	188,207	11.0
1936	256,903	14.7
1935	285,320	15.6
1934	293,173	15.3
1933	304,202	14.9
1932	253,608	11.9
1931	187,585	8.6
1930	153,046	6.8
1929	134,353	6.0
1928	149,252	6.6
1927	141,038	6.2

The urgent demand for open-top cars of all kinds to handle record shipments of ore, coal, coke, iron and steel, finished war materials and equipment during 1944 confronted the railroads with a tough problem which was solved in the main, but not in its entirety. Only 2,334 new gondolas and 10,865 new hopper cars were installed up to August 1; the percentage of those in bad order increased slightly over the preceding year; and the number of serviceable on September 1 included 333,410 gondolas and 503,043 hoppers.

Similarly, the demand for plain flat cars in conjunction with the war production program was exceptionally

Age of Freight-Carrying Cars on Class I Railroads as of January 1, 1944

Years old	Number of cars	Per cent of total*
1 to 5	243,301	13.85
6 to 10	151,997	8.65
11 to 15	157,663	8.98
16 to 20	365,106	20.79
21 to 25	299,238	17.03
Over 25	539,329	30.7

* Total ownership 1,756,634.

large, as many as 1,000 flat cars, or drop-end wood-floor gondolas, for example, being required for army divisional movements. The supply of about 500 plain, depressed and well-type flat cars having more than 151,000 lb. capacity was distributed and used in such a way that shipments to all parts of the country were made without undue delay and the cars promptly returned to the relatively small number of owning roads principally in the Eastern-Allegheny district.

During the first nine months of 1944, the increase in refrigerator car loadings was 10.6 per cent, as compared with the corresponding period in 1943, and the ownership declined 1,094 cars. Further progress was made in the heavier loading of refrigerator cars and the proportion of empty mileage was reduced from 40.4 per cent during the first six months of 1943 to 36.4 per cent during the first half of 1944. The I. C. C. order, permitting the use of up to three refrigerator cars in place of each box car ordered for westbound transcontinental shipments in car loads to points in California, Idaho, Arizona, Nevada and Utah, resulted in the movement of 98,817 loaded refrigerator cars under this order in the first nine months of 1944. This operation relieved heavily-burdened western carriers and made many box cars available for loading in other sections of the country where they were badly needed.

Some relaxation in the demand for tank cars occurred during 1944, but with only one short period of actual surplus reported in September. Miles per car per day for tank cars reached a new high of 137.7 during April which may be compared with 50 miles per day prior to the war. Special attention to tank car maintenance by railroads and car owners enabled the number of bad order tank cars to be reduced to 4 per cent. The Car Service Division reported in December that practically all tank cars were in active service and this condition will probably continue during the present year or at least until conclusion of the war with Germany.

Slow Progress in Getting Lightweight Cars

Railroads are unquestionably hauling around too much dead weight and, in spite of all the emphasis during the last few years on the economic advantages of weight saving, only a relatively small percentage of lightweight freight cars have been installed to date. Herbert Ashton, assistant to the director, Division of Railway Transport, O. D. T., presented some highly pertinent figures in an article in the *Railway Age* issue of September 23, 1944, proving not only that the dead weight of freight trains has grown out of proportion to the increase in pay load, but that enlarged car size and capacity are not being fully utilized to obtain potential savings.

For example, the net tons per train increased from 708 in 1920 to 1,035 in 1942, or 327 tons and 46 per cent. Gross tons per train increased from 1,443 to 2,277 in the same period or 834 tons and 58 per cent. The difference between gross weight and net weight per train represents dead weight and, therefore, the figures quoted show dead weight has increased more than live load carried.

Most of the freight cars installed in 1944 were of rather heavy carbon-steel construction and, while both low-alloy high-tensile steels and strong aluminum alloys are now increasingly available for railway use, carbon-steel cars are still being ordered for delivery this year.

One stumbling block in the way of more rapid installation of lightweight cars is the fact that individual railroads are generally not keen to pay a premium in price for an improved car which may be off the line most of the time, to the benefit of other roads. The answer to that somewhat reactionary view is that, if all railroads take the same position, this potentially important improvement affecting the economy of railway operation never will be generally adopted.

Another deterrent is that, with maximum possible weight savings realized from new materials and modern welded construction, the light weight of freight cars will, in many instances, be sufficiently low to require the application of empty and load brakes, or some form of load-compensating brake at a relatively small increase in weight and cost. In this connection, it seems apparent that such an improved brake may be justified, not only to permit making maximum savings in car weight, but to facilitate operating freight trains of the future faster, more heavily loaded and with equal or even shorter stopping distances.

Changes in the steel situation during last year permitted the return to all-steel car construction, with some reservations regarding the amount of plates and sheets used, and the A. A. R. Car Construction Committee has prepared designs of a number of "Victory" cars, including three box, one automobile-box, nine gondolas and two flat cars. Further studies will be made this year in connection with improved designs of standard freight cars, including an aluminum hopper car. One steel-frame box car with complete aluminum exterior sheathing was built in 1944 and a number of box cars, including even more extensive use of aluminum, are now under construction for trial service on several roads.

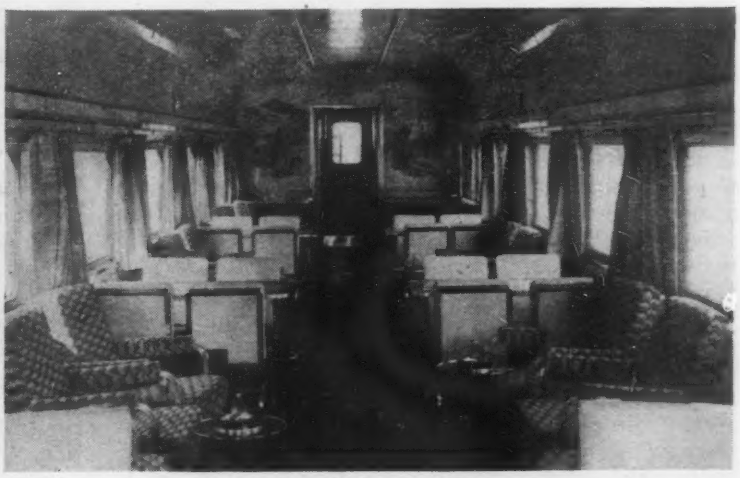
Car-truck manufacturers continued the development of improved freight-car trucks for high-speed service and the A. A. R.-approved tubular axle is being generally accepted for use in modern trucks where attendant weight saving and other advantages are desired. Other new axle designs, including one centrifugally cast hollow axle, will probably be tested this year. Laboratory tests of helical springs for freight cars were completed in 1944 and it is planned to make road tests of these springs in conjunction with snubbers some time this year. One design of hydraulic snubber for freight cars is now being developed.

Considerable other constructive investigation and research work was conducted by the A. A. R. last year, or is now contemplated, with a view to improving freight car conditions of the future. A few of these projects which may be mentioned include continuing tests of air-brake equipment; acceptance tests of modern geared hand brakes; specification tests for draft gears; coupler and draft key improvements; new designs of bolsters and side frames; journal-box and bearing details adapted to reduce hot boxes; tests of roller-bearing lubricants, and studies looking towards the standardization of journal sizes and roller-bearing boxes for high-speed freight equipment; laboratory tests of various types of hot-box alarms and indicators; authorization of service tests for 200,000 chilled car wheels of improved design with changes mainly in the tread section; observation of one-wear steel wheels with reinforced flanges to permit reclaiming them after condemning limits are reached, by turning to the multiple-wear flange contour.

Whenever possible in these investigations, the various committees and the mechanical engineer's office of the A. A. R. Mechanical Division have solicited and received the hearty co-operation of manufacturers directly interested in the various specialties. The resultant combination of inventive genius, engineering skill, and experience in service requirements is doubtless responsible, to no small extent, for the remarkable transportation records which the railroads established in 1944 and will probably surpass in some particulars in 1945.

PASSENGER *cars of the future*

Installation of new types of construction and interior facilities interrupted by the war will be resumed—More changes probable



Designers Will Continue to Exercise Their Ingenuity to Effect a Variety of Pleasing Effects in the Arrangement of Seats, Chairs and Tables in the Interiors of Passenger-Carrying Cars

By C. B. PECK
Mechanical Department Editor

NINETEEN forty-four was the third year in which the construction of passenger cars has been practically at a standstill. The inability to add to existing rolling stock has created an acute problem for the railways; they have had to keep what cars they have in condition for safe operation, and in as nearly satisfactory condition for passengers to ride in as possible, with not enough time to repair them. New highs in passenger-car utilization have been established. But this is of no real significance except as evidence of the good nature of the traveling public when faced with the inconvenience and discomfort of overcrowding as the only alternative to staying at home.

When the war is over high records of utilization will cease to be the objective. The passenger will no longer be compelled to put up with discomfort and inconvenience in order to travel at all. The railways, competition-conscious, will not fail to provide coaches, sleeping cars, parlor cars, diners and club cars which will attract the traveler with all the wiles which the engineer, architect and decorator can conceive, and there will be enough cars so that crowding will be unnecessary.

What will these passenger-carrying cars of the post-war period be like? Not very different from the best of the cars built during the seven years just before the war. But very different from the great majority of the cars in service today. They will also depart from the old standards in important respects technically, some of which will play an important part in building up passenger appeal and some of which will be primarily economic in their effect.

Features Affecting Comfort and Attractiveness

With the advent of the streamliners ten years ago, began an era of departure from the conventional interior arrangement of passenger-carrying cars. Designers and decorators have, ever since, been exercising their inge-

Ten years ago the railways discovered the coach passenger. When the war is over he will again be the center of attention. Coach seats are being made comfortable for day and night travel. Coach dressing-room and toilet facilities rival those of the sleeping car. Travel pleasure is being enhanced by reduced noise and a smoother ride. Look for more new ideas in the early post-war years.

nuity to effect new and attractive arrangements of tables in dining cars and to place seats, chairs and tables in lounge cars in inviting informal groups. To those accustomed to the standardized monotony of such cars in the days when the treatment of walls and floors, the design of the chairs and their placing in the cars were all left to a draftsman in the mechanical engineer's office, it is a constant marvel to see the variety of pleasing effects which have been achieved with the awkwardly proportioned passenger-car interior. The versatility so far displayed promises much more to come.

The trend of the past ten years has been to transfer some attention, formerly all concentrated on the sleeping- and parlor-car passenger, to the coach passenger. The success of all-coach over-night trains indicates a continuance of this trend. A few coaches for these services have been built with especial attention to the provision of adequate toilets and ample dressing rooms. Attention to such details will undoubtedly increase.

Structural Modifications

A further evidence of the discovery of the passenger to whom the sky is decidedly above the limit when traveling is the three-tier sleeping car. This is another approach to the problem of intensive utilization of the limited space of a passenger car, one answer to which is found in the duplex bedroom car. There seems little reason to expect a perpetuation of the open-section sleeping car beyond the life of such cars now in existence.

Even commuter traffic seems likely to come in for novelty in some form of multiple-deck car. The commuter has been subjected to at least two experiments within the past fifteen years. One was the much berated so-called "one-and-one-half and two-and-one-half" seating arrangement. Based on limited experience with it, the multiple-deck arrangement seems likely to meet with a better reception on the part of the patrons.

Nothing in the coach has as much to do with the comfort of a passenger as the seat in which he must spend the major part of his traveling time. With the new emphasis on the comfort of the coach passenger which began during the 1930's a complete revolution has taken place in seat construction. The walk-over type gave way first to the bucket type borrowed from the bus, and then to seats designed specifically to conform to the human body and carefully dimensioned to provide the greatest comfort to the greatest number of passengers, both day and night. The rubber foam type of cushion, already finding its place before the war cut off the supply of material for its fashioning, will again be available.

In addition to the mohair fabrics, which were available before the war in a variety of textures and colors, are the new synthetic textiles from the plastic field which are said to be non-inflammable, non-absorbent, and non-fading.

In the newer cars of the prewar period a number of useful applications of plastics had been developed. These included table tops, window sills and other architectural details. As the variety of these materials increases the uses to which they can be put will undoubtedly multiply. Such uses may involve specially moulded forms as well as sheets.

The improvements in heating systems to effect more uniform temperature distribution and the refinements which are becoming available in air conditioning and lighting are referred to in another article in this issue.

One of the minor advantages of air conditioning and the accompanying pressure ventilation of passenger cars has been the elimination of the movable window sash which traditionally defied efforts to move it. Now available are double-glazed sash, protected against fogging, with non-glare glass and shatter-proof inner panes.

Structural Material Pattern

No mean factor in the comfort and attractiveness of travel in the postwar railway car will be the absence of noise and high-frequency vibration commonly experienced in the cars of conventional construction. Rubber and other vibration-reducing materials have proved effective insulators to keep noise and vibration originating at the rail and in the truck out of the car body.

The structural material pattern of postwar passenger rolling stock was pretty well established before the war cut off the supply of materials for passenger-car construction.

Low-alloy high-tensile steels, strong aluminum alloys, and stainless steel all have been extensively used and undoubtedly will continue to be, primarily because of their weight-saving possibilities. Methods of construction adapted to these materials have been well established.

Probably no more intensive development has been devoted to improvement of any feature of passenger cars during the past few years than to the truck. Trucks especially adapted to producing a smooth ride under lightweight car bodies are already available. Other developments are underway and will be heard from later.

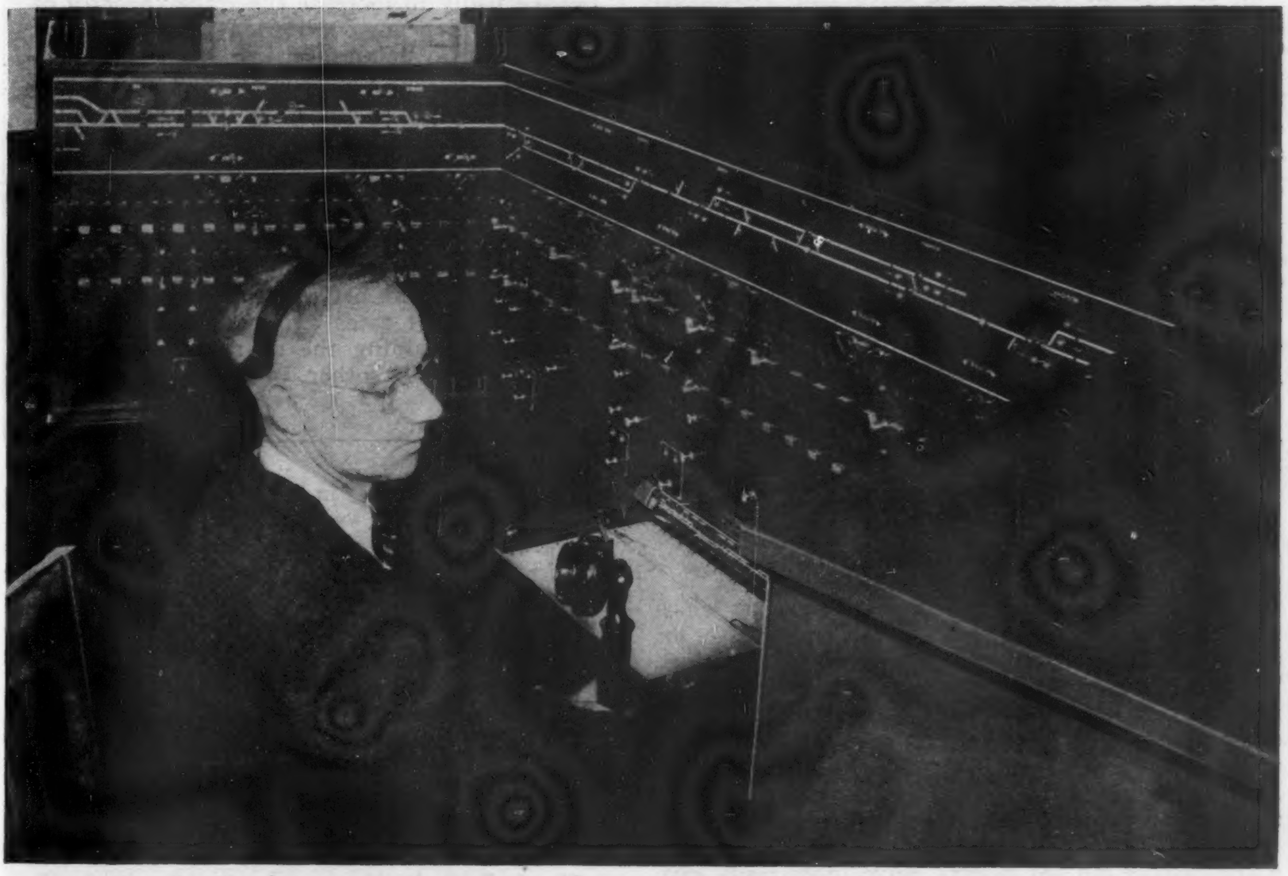
The interest displayed in the tight-lock coupler for passenger cars indicates that the use for this device will continue to spread. Associated with draft gears and buffers designed to provide soft graduations of the initial draft-gear movement, they will do much to smooth out the longitudinal shocks in passenger trains made up of the new lightweight cars.

The Picture Is Still Not Complete

While this description of the passenger car of the future presents nothing which is not entirely familiar to those fortunate enough to travel on the streamliners and trains made up of rolling stock which is contemporary with the streamliners, it presents a picture which is still quite unfamiliar to the great majority of railway patrons. But it is not quite a complete picture.

The decade immediately following World War I was a period prolific with railway improvements. This applied particularly to the development of the steam locomotive, but it also encompassed the evolution of the rail motor car and many changes in railway operating methods. There is every reason to believe that the early years following the end of World War II will be no less prolific in the launching of new developments and improvements in railway equipment and methods. The picture here drawn may, therefore, prove deficient in representing the best in railway passenger rolling stock which will be available in less than ten years after the close of the present war.

much SIGNALING *to be done*



The C. T. C. Machine at Brady Jct., Pa., on the Pennsylvania, Includes an Automatic Train Graph Which Shows Whether Trains Use Sidings

Improved train performance and economy of operation necessitate the replacement of antiquated signal apparatus with new equipment and modern systems

By JOHN H. DUNN
Signaling Editor

IN ADDITION to the problems of maintaining and operating the existing railroad signaling facilities as an aid in handling war-time traffic, the railroads should plan future installations of new and modern signaling systems as a part of the overall railroad rehabilitation program after the war. During the last three years, new signal construction has been limited by the War Production Board to those projects which would increase track capacity immediately on those sections of line which were handling war-time traffic. To perform this restricted amount of construction, and at the same time maintain the existing signaling facilities, was about all that could be done by the limited signal forces available on the railroads.

Similarly, the manufacturers of signaling equipment have been hampered in completing equipment for those projects which were authorized by the War Production Board. At various times, there have been shortages of brass, insulated wire, steel castings or other materials. In spite of all these difficulties, the manufacturers and the railroads have co-operated to the end that a considerable total volume of new signaling projects were completed in 1944, as explained in the statistical section elsewhere in this issue. The Annual Outlook and Statistical issues for 1943 and 1944, included detailed explanation of specific examples in which signaling facilities were solving war-time problems by increasing track capacity and relieving shortages in locomotives. Rather than pursuing this subject further, the following discussion deals with the reasons why signaling construction is behind schedule and discusses means by which modern systems of signaling can be applied to keep trains moving at the speed for which post-war locomotives and tracks are to be designed.

At the end of World War I in 1918, the railroads had only three forms of signaling: (1) interlocking, (2) automatic block signaling, and (3) a limited amount of automatic track-circuit controlled highway crossing protection. During the period 1919 to 1929, research and development brought out three new systems of signaling, including train control with cab signaling, centralized traffic control, and car retarders. Furthermore, means were developed for controlling highway crossing gates automatically by track circuit control, thus permitting this form of more complete protection to be installed at numerous crossings where it was not practicable previously.

The railroads were just getting a good start in installing these new systems when the financial depression struck in 1929, and the limitation of funds for new facilities continued for nearly 10 years. Since 1941, war conditions have restricted the construction of new signaling. Therefore, as compared with the year 1919-1920, the first few years following the close of World War II will call for a greater volume of construction, not only because the projects needed have been postponed for a longer period, but also because there are now four more systems of signaling than were available in 1919.

Replacement of Older Systems

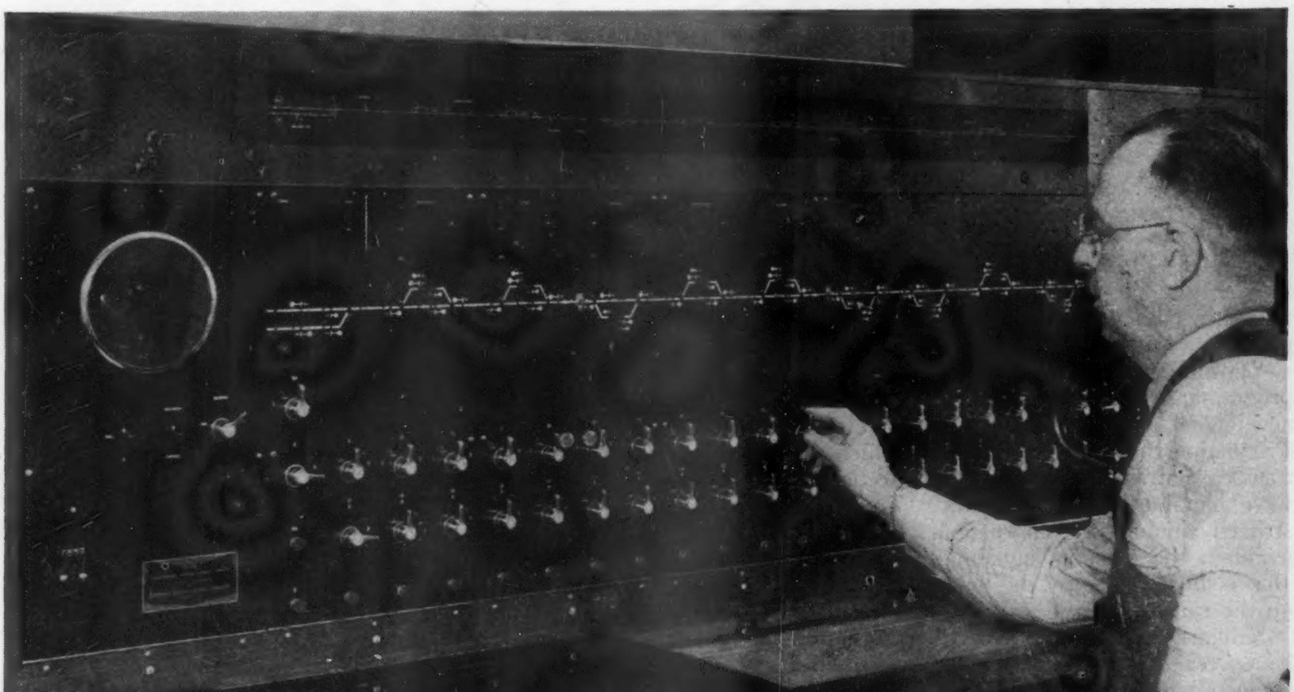
The interlocking and automatic block signaling which were in service at the close of World War I have, for the most part, been continued in service because there has been little opportunity to make extensive replacements in kind. In the meantime, the weights and speeds of trains increased from year to year, and as a result the train stopping distances increased to more than the length of the automatic blocks. Many roads rearranged the signals as required, but others have added overlaps so that two signals to the rear of a train in certain sections would display the red aspects, while other roads have changed controls so that two signals in succession would display the yellow aspect in approach to one displaying red. These temporary expedients are not good signaling practice and they reduce the track capacity, thus introducing train delays. On much of the single-track signaling using overlap controls, relocations of signals and changes of circuits are necessary to conform with the rules and regulations of the Interstate Commerce Commission.

As applying to automatic signaling as such, there is much rehabilitation and replacement work that has now been postponed too long, and, therefore, will have to be taken care of as soon as possible after the war.

The procedure to be expected in these replacement

For the duration of this war, all the available signalmen and materials that can be manufactured will be required to maintain existing facilities and to construct projects which are needed badly to increase the track capacity of sections which are overloaded with important war traffic. Whereas, after peace comes, extensive programs of signaling construction will be required not only to rehabilitate antiquated equipment but also to install new systems of signaling such as cab signals, car retarders and centralized traffic control, all of which will pay for themselves by savings in train time and operating expenses. These improvements will be factors in reducing overall time of trains between termini as well as holding freight rates and passenger fares in line, thereby aiding the railroads in meeting competition with other forms of transportation.

The C. T. C. Machine on the Canadian National at Halifax, N. S., Is Typical of Modern Signaling



The All-Relay Interlocking Machine at Helper, Utah, on the Rio Grande Is Mounted on the Operator's Desk

programs is indicated by the practices followed on a few sections which were changed over before the war started. The old semaphores are replaced by light signals, thus obviating mechanical failures of mechanisms as well as failures due to frost on contacts and motor commutators. The previous combination of neutral track circuits and line wire circuits is replaced by modern coded track circuits, thus dispensing with line wires, and thereby eliminating failures and train delays due to wires being broken by sleet storms or trees falling on the line.

A Different Problem on Single Track

On single track lines where train movements are authorized by timetable and train orders, much time is lost because there is no means for taking advantage of changing conditions. For example, a train may wait 30 minutes or more on a siding when otherwise this train could be kept moving if there were some means whereby the dispatcher could contact the train on a minute-to-minute basis. This can and is being done by centralized traffic control, which includes signals at the sidings controlled by the dispatcher, to authorize trains to move thus dispensing with train orders. This system, including power switches at the sidings, known as centralized traffic control, was installed on about 2,700 track miles prior to 1942. This system, when installed on a busy single track line, will save about one minute per mile for each freight train. On this basis, C. T. C. was installed as fast as possible during 1942, 1943 and 1944, on single track lines which were handling heavy war-time traffic, about 3,000 track miles being so equipped in the three war years.

Following the close of the war, C. T. C. will be installed as fast as practicable on a large percentage of the remaining mileage of the more important single track lines. The savings in train time will be needed to reduce overall schedules between termini, and the savings effected in operating expenses will help to keep rates at a level that will hold traffic. In other words, these C. T. C. projects can easily be justified economically, and will be a necessity as an effective aid in meeting competition with other forms of transportation.

On lines handling a medium to heavy volume of traffic, complete C. T. C. with power switches will be used. On lines handling a medium volume of traffic, a system including the control of semi-automatic signals to authorize train movements will obviate the delays now occasioned by train orders. An installation of this nature, known as remotely-controlled manual block with track circuits throughout, was completed and placed in service in 1944 on 34.7 miles of single track on the Wabash.

On double track lines where the siding switches are hand-operated and train movements are authorized by timetables and train orders, there is a need for C. T. C. to reduce train delays. Furthermore, on some sections of double track both tracks are equipped with C. T. C. and are signaled for train movements in both directions so that an idle section of track can be used to run a train around another slower train of the same direction, thus keeping both trains moving rather than one wasting time waiting on a siding.

Combinations of Interlockings

A feature of modern interlockings is the use of so-called panel type control machines with miniature levers or buttons, and in which the interlocking is accomplished by interconnections of circuits rather than by mechanical locking between levers and by electric locks on levers. One man seated at a panel type machine can readily handle the control of a large layout or what was previously two or more separate interlockings. Furthermore, the line-ups are changed quickly and the operations are expedited because the controls for the entire area are concentrated at one point, thus eliminating confusion and delay caused by communications between various offices. On account of the improved train operation and the economic advantages, these modern all-relay interlocking control systems will be installed at numerous locations to replace previous interlocking machines as soon as materials and construction men are available after the close of the war.

During World War I, freight cars lost hours and hours while passing through certain classification yards. However, car retarders were developed in 1924, and have been installed in about 45 yards up to the present time. As a result these yards can be operated at peak capacity day and night with no delays and at minimum operating expense.

In some instances, the average time of cars through a yard have been reduced as much as 3 hr. 30 min., while at the same time the average number of cars per day have increased as much as three times.

After this war, when every means will be needed to reduce overall time of cars between shipper and consignee, much can be accomplished by installing retarders in several more existing yards as well as in other gravity yards which are to be built. An important fact is that such projects easily effect savings which more than carry the investment required.

More Highway Crossing Protection

For two reasons, the construction of highway crossing protection was reduced practically to zero during the past three years. As a result of the rationing of gasoline, the volume of highway travel was reduced, and, therefore, the construction of new highway crossings was limited to crossings which were handling increases in traffic in the vicinity of camps or war industries. As soon as restrictions on the use of gasoline are lifted, the volume of highway traffic will increase rapidly. New installations of automatically controlled crossing protection will be needed at once on many crossings, special consideration being given to the need for gates at all crossings which handle heavy traffic on multiple-track lines. In 1941 protection was installed at 1,120 crossings, and a program of approximately this number of crossings annually will be required for several years after the close of the war.

Engineman Using Train Telephone to Talk with the Conductor in the Caboose

train communication

HOT *in '44*

Development of inductive system for road service bears fruit, and also research in high-frequencies has opened new possibilities for the use of radio

By *JOHN H. DUNN*
Associate Editor

AFTER being practically dormant since 1930, intense interest in train communication burst forth in February, 1944, and has continued at white heat since that time. Although the benefits of two-way telephone conversation between the head-end and rear of moving trains, between trains, and between trains and wayside offices, have been visualized for many years, and numerous such systems were tested starting in 1914, nevertheless it was not until 1944 that systems were available which were in all respects practicable for extensive installations, and at the same time showed promise of being acceptable by government authorities.

During the decade starting in 1920 several railroads co-operated with manufacturers in experiments with telephone train communication apparatus. In 1920 the New York Central worked with the DeForest Wireless Company and the following year with the General Electric Company. In 1924 the Norfolk & Western co-operated in testing apparatus from the Westinghouse Electric & Manufacturing Company. In 1926 the New York Central made an experimental installation between Englewood, Ill., and Elkhart, Ind., using apparatus made by the Zenith Radio Corporation, and in the following year this road tested General Electric Company apparatus between Utica, N. Y., and Selkirk Yard. In 1928 the Chesapeake & Ohio made a test installation of radio furnished by the Westinghouse Company, and after further improvements this equipment was tested on the Pennsylvania between Altoona, Pa., and Harrisburg.

At that time, radio had been developed to use frequencies within certain ranges and therefore the possible assignments of wave lengths were limited. Radio apparatus installed on a train fell within the Department of Commerce classification of mobile equipment, and five communication bands were assigned for such service. The highest frequency band was 16,000 to 18,000 kc., while the lowest band was 2,300 to 2,750 kc. There were in addition three intermediate frequency bands but the railroad experimenters at that time favored the lower frequencies. In the judgment of the Federal Radio Commission (now the Federal Communications Commission), other fields of activity, such as aviation and ship-to-shore, had greater need for the wave bands available than did the railroads for train communication. Therefore, in 1930 the Commission withdrew the licenses which had been granted for railroad use. This left some of the railroads with rather expensive radio apparatus which was sold for junk. To complete the record here, it should be mentioned that tests of radio using higher frequencies were made in 1934 on the Central of New Jersey and the New Haven, as well as on the Pennsylvania in the years 1933 to 1937, inclusive. The use of radio for train communication was not again revived until 1944, when the development of high-frequency equipment opened up vast new ranges of frequencies which might be available for use on railroads. These matters are to be decided by the Federal Communications Commission.

Inductive System Confined to Right-of-Way

During the 1920-30 decade, in addition to radio, some roads attempted to use what was then termed the wired wireless, but these tests did not lead to permanent installations. Starting in 1930 the Bessemer & Lake Erie co-operated with the Union Switch & Signal Company in the development of the inductive system of telephone train communication, in which the transmission was accomplished by energy at 5,700 cycles superimposed on the rails as well as in part on the wires on the pole line. In these tests one truck of the caboose was insulated from the remainder of the car, and similarly a truck of the locomotive was insulated. The results obtained by this development were explained in an article in the *Railway Age* for July 20, 1940. Using the same type of U. S.

For 30 years, men have visualized the benefits of, and tested equipment for, two-way telephone conversation between the locomotives and cabooses of freight trains, between trains, and between trains and wayside offices. Starting in 1920, numerous tests of radio were made in classification yards and for road service, but the Federal Communications Commission did not grant licenses, and, therefore, development was discouraging. Subsequently, the inductive system was developed and installed in several classification yards and tests were under way on two extended road sections. In 1944, developments of the inductive system were consummated and contracts made by one road for an engine district of 234 miles and by another road for two divisions. In the meantime, the development of high frequency radio apparatus opened new possibilities for the assignment of wave lengths for train communication which is a matter to be decided by the Federal Communications Commission.

& S. Co. inductive system, the Pennsylvania made a 50-mile installation in 1941 on the Belvidere Branch between Trenton, N. J., and Phillipsburg. The results of this test were published in an article in the *Railway Age* of February 12, 1944.

On August 7, 1944, the Pennsylvania announced that a contract had been made with the Union Switch & Signal Company for materials to install this inductive train communication system on 245 miles of four-track main line between Harrisburg, Pa., and Pittsburgh, including 275 locomotives, 90 cabooses and 6 wayside stations. Equipment will be installed on the passenger locomotives but not on any passenger train cars. The energy used for transmission in this project is at higher frequencies, 88 kilocycles and 120 kilocycles, and other developments have been adopted so that it will not be necessary to insulate a truck on either the cabooses or the locomotives.

Also throughout the summer months of 1944 the Kansas City Southern co-operated with the Aviation Accessories Corporation in the testing of a carrier type of telephone train communication system in which the transmission is accomplished by 170 kilocycle frequency superimposed on the wires on the pole line. Results of this development were published in the *Railway Age* of November 11.

Radio Re-enters

In the meantime, radio equipment using frequencies much higher than employed in conventional commercial broadcasting had been developed and manufactured in large quantities for military uses. These developments in high frequencies pointed to the possibility that the railroads might possibly secure assignments of frequencies for using radio as a means of transmission for train communication systems. As a result, some railroads secured experimental licenses from the Federal Communications Commission to make tests with radio equipment operating on various ranges, such as 30.6; 39.5; 40; 80; and 156.65 megacycles, and one road made tests between 200 and 300 megacycles. These tests were made on various roads including the Denver & Rio Grande Western, which used General Electric equipment; the Burlington, the Santa Fe, the Seaboard, and the Baltimore & Ohio which used Bendix apparatus; the Rock Island which used various types of equipment, including Galvin, and some made up especially to specification of the railroad. Reports of these tests giving details of the frequencies, power output, and methods of power supply were published currently in issues of the *Railway Age*.

In a hearing held September 13 to 20, the Federal Communications Commission received evidence from representatives of the railroads and manufacturers concerning the use of train communication on the railroads, especially with reference to the need for assignment of frequencies for this service. One witness speaking for the railroads as a whole requested frequencies in certain ranges, and other witnesses speaking for their individual railroad made other requests, all of these matters being reported in detail in the *Railway Age* of September 23, page 472. The F. C. C. has not as yet announced the assignments of frequencies for radio communications on railroads.

Uses for Train Communication

During the F. C. C. hearings in September, witnesses for the railroads explained the need for and uses of train communication. The conductor in the caboose can telephone to the engineman when the train line is pumped

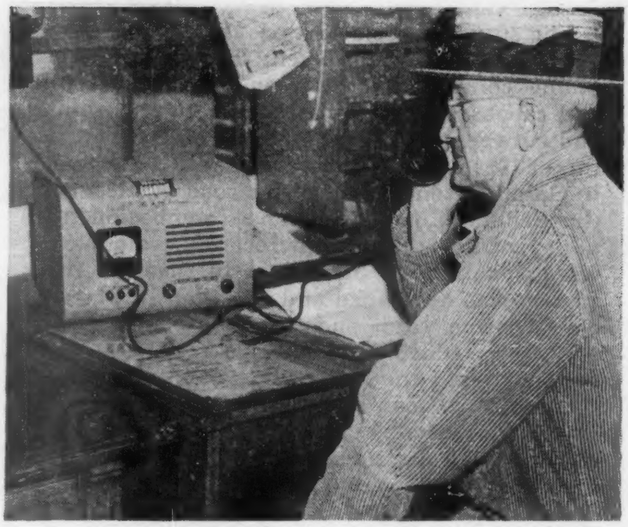
Conductor at Telephone to Inform Engineman When Train Line Is Pumped Up

up and can give a verbal highball to depart, thus saving delays otherwise occasioned in passing hand signals the length of the train. If the men at the rear of a train notice a hot-box or dragging equipment, they can telephone to the engineman to stop the train, otherwise in many instances the conductor would be obliged to pull the air at the rear, which might result in the train being pulled in two. When a train is to be stopped to set out or pick up cars, the conductor can use the telephone to aid the engineman in spotting the train, thus reducing the time lost in switching. When a train is stopped for some unusual reason, the engineman can advise the conductor so that he can act accordingly. Likewise the engineman can be advised when the flagman has returned to the caboose so that the train can be started at once, without waiting for hand signals. When the rear of a train is departing from a siding or has passed through a crossover, the conductor can advise the engineman so that the train can be accelerated at once, rather than dragging along for several car lengths.

As was evident during several extensive road trips on freight trains equipped with train communication, there are numerous other occasions which arise due to local conditions. On installations where certain wayside stations are equipped the conductors or enginemen can inform the station operators of any unusual conditions affecting progress of the train, and this information can be passed along to the dispatcher so that he can co-ordinate the operations of other trains accordingly.

At the F. C. C. hearing the railroad witnesses did not contend that the use of train communication would be a direct means for improving safety, and they did not propose to use this form of communication to replace other types of fixed telephone and telegraph facilities or to obviate the installation of safety systems such as block signals. In other words, the railroads visualize train communication as a means for avoiding or minimizing delays to trains. On the witness stand J. H. Aydelott, general manager, Chicago, Burlington & Quincy, said in effect that "safety is dependent on orderly operation, and since train communication facilitates orderly operation, it also promotes safety."

Hump Conductor Telephoning to Engineman in Yard Locomotive



Yardmaster Talking to Engineman in Yard Locomotive

Yard and Terminal Communication

All of these facts were not, of a sudden, learned by railroad officers in February, 1944. The important fact is that train communication in a completely developed form was not available until mid-summer of 1944.

The term yard communication has been applied to voice transmission from a central point to enginemen of locomotives in a yard or in a terminal switching area. For example, in a freight classification yard the conductor at the hump can speak directly to the engineman of the locomotive being used to push cars over the hump. Such a telephone system using the Union Switch & Signal Company inductive system was installed in 1940, in the DeCoursey, Ky., yard of the Louisville & Nashville. Since that time this same inductive type of communication has been installed in 15 other yards, including 8 on the Pennsylvania; 3 on the Burlington, and 1 each on the Great Northern, the Norfolk & Western, the Big Four, and the Terminal Railroad Association of St. Louis. These projects include communication equipment on a total of 52 locomotives and in 17 offices.

Temporary Frequencies Assigned

In June the Rock Island made an installation of radio telephone equipment in the yard office and on locomotives used in the yard at Blue Island, Ill., using Galvin radio equipment. In July the Baltimore & Ohio tested Bendix radio apparatus for terminal service in Baltimore, Md., and in November the Burlington installed Bendix radio apparatus with equipment in three offices and in three switching locomotives used to pick up and set out cars at freight houses and industries in the Chicago area. The Federal Communications Commission granted temporary assignments of radio frequencies for these tests. Permanent installations of radio apparatus for yard and terminal communication depend on the granting of permanent licenses by the F. C. C., just as is true of radio for train communication on the road.

work EQUIPMENT *saves the day*

Faced with an acute shortage of labor, the railways have turned to power machines and tools as a most important contribution to the solution of their maintenance problems

Heeding a lesson learned during the depression years, that power machines and power tools can be used partially to offset a shortage of men, during the war years the railways have been acquiring units of work equipment at an unprecedented rate. While this has enabled them to maintain their tracks and structures in condition to carry the greatest volume of traffic on record, almost every road is still in need of additional units. Furthermore, the machines they now own have been used so intensively that many of them are approaching the end of their service life, thus increasing still further the demand for additional units.

By GEORGE E. BOYD
Associate Editor

Cranes an Essential Today for Laying Rail

NEVER in the history of the railways has the density of traffic been so high as it is at present; never before have trains been operated at such high average speeds; and at no time in the past have the track and structures required such constant attention or so high a standard of maintenance as they do today, to enable them to carry this unusual volume and speed of traffic. Yet, despite the abnormal demands that are being made on the maintenance-of-way forces, relatively fewer men are now available to perform essential maintenance tasks than in any previous period.

Rely on Power Machines

Furthermore, this situation has prevailed for three years, or since early in 1942, with no improvement in sight so long as the war lasts. In fact, conditions with respect to labor, which have grown worse steadily month by month throughout the country, long ago reached the critical stage as men were inducted into the armed forces or were attracted to war industries by the higher wages they were able to obtain.

With more work to do and relatively less men with which to do it, maintenance officers, almost as a unit, have turned to power machines and tools as the only means available for maintaining their tracks and structures in a safe and satisfactory condition to carry the extraordinary volume of traffic that is moving over them. These officers learned during the depression, when they were forced by lack of funds to reduce their forces drastically, that while there is no complete substitute for man-power, they could employ power machines and power tools to advantage to supplement and aid the forces they were able to obtain with the funds then at their disposal, and thus increase the productiveness of their depleted forces without materially increasing their effort.

The conditions of the depression years with respect to maintenance have been intensified since 1940, and with respect to labor since 1942, when the shortage first began to be in evidence. Although they were aware of the advantages of work equipment and of the benefits to be derived from increasing its use as labor became scarcer, few railway officers realized the extent to which they were going to need this equipment, and all but a few found themselves sadly deficient in both the number and types of machines they needed in 1942, as is demonstrated by the fact that they purchased 7,612 units of 156 different types during that year.

Not to be caught napping a second time, the budgets for 1943 were increased measurably and 8,507 units of work equipment were purchased that year, an all-time record, the nearest approach to which was in 1941, when purchases aggregated 8,007 units. Thus, during the three years, 1941 to 1943 inclusive, the railways purchased a total of 24,126 units of all types, not including

Fastening the Newly-Laid Rail with Mechanical Spike Drivers

switch heaters, of which many hundreds were bought, involving expenditures in excess of $33,000,000, and raising the total investment in work equipment to around $120,000,000.

As the shortage of labor increased in severity, the need for mechanization became still more imperative and maintenance budgets at the beginning of 1944 called for 7,700 units, of a wide variety of types, while the actual purchases for the year reached a total of more than 10,000 units. Yet, even larger purchases would have been made in both 1943 and 1944 if government priorities had permitted, and if manufacturers had been able to obtain all of the materials that were released to them.

Point of Saturation Far in Future

For a number of years some manufacturers have expressed the fear that at the rate work equipment has been purchased in recent years, numerous types would soon reach the point of saturation and that sales would then drop to the point where manufacture would no longer be profitable. This possibility is refuted by the continued large purchase of motor cars, for motor cars have not only been in use longer than any other type of work equipment, but they are in universal use, that is, they reached the point of saturation years ago. Yet, despite this and the continued large purchases for several years, more motor cars were purchased in 1943 than in any previous year, and a total of approximately 3,000 cars were bought in 1944.

One of the outstanding examples of the increasing use of power machines and tools is furnished by tie tampers. Originally conceived of as equipment for large gangs only, they made headway slowly outside of large ballasting operations, because the outfits were heavy, cumbersome and difficult to handle by any but the larger gangs. However, the introduction of the unit tamper, which is adapted for spot surfacing as well as for larger operations, created a strong demand for light multiple-tool outfits that are suitable for section gangs, which is being met in part by relatively light-weight two and four-tool outfits.

Applications of ballast have been in arrears since the beginning of the depression a decade and a half ago, and during the last four years of intensive traffic, ballast has been fouling at an unprecedented rate, while scarcity of labor has prevented replacement on a scale even approaching requirements. In their efforts to apply the maximum amount of ballast possible, the railways have purchased an unusual amount of tie tamping equipment, the purchases for 1943 having been 284 unit tampers and 504 complete outfits, in addition to which approximately 600 unit tampers and 475 complete outfits were purchased in 1944.

As a further means of overcoming the handicap imposed by a deficiency of ballast, more ballast-cleaning equipment has been purchased than in previous years, and the indications are that these purchases will continue to be large, since the practice of cleaning ballast has now been established on numerous roads that were formerly only mildly interested in this operation.

Rail Wear Giving Concern

Another major problem confronting maintenance officers is the rapidity with which rail is wearing out under the extraordinary traffic that is moving over it, coupled with the severe restrictions that have been imposed on purchases of new rail. Quick release of tracks upon which rail is being laid is of such importance under present conditions that unusually large purchases of rail-laying equipment have been made during each of the last four years, while those planned for 1945 will be still larger, in the expectation that there will be further relaxation of the present stringent restrictions on purchases of rail.

Disturbing deficiencies have existed for more than ten years in the replacement of rail, with excessive deficien-

cies piling up during the later years of this period. Obviously, all of this under-maintenance cannot be overcome immediately, but must be spread out over a number of years, so that the demand for power machines and tools incidental to laying rail and ballasting is certain either to remain at its present level or to increase for several years, the purchases for 1943 and 1944 having been 1,503 and approximately 1,750 units, respectively.

An important development in the work-equipment field which has been under way for several years is the introduction of a wide variety of small portable power machines and power tools for use by small gangs or by small units of larger gangs. These include such widely-divergent types as grinders, drills, borers, timber and rail saws, power and impact wrenches, bolt tighteners, tie borers, weed burners, paint and creosote sprayers, paint-cleaning tools and other types that are largely replacing manual methods. Approximately 1,000 of these tools were purchased annually from 1941 to 1943 and about 1,500 in 1944, while the demand for 1945 will probably be still larger. Furthermore, the purchase of these tools invariably requires a proportionate increase in the purchases of air compressors and generators for their operation.

Another trend that is growing more pronounced is the demand for large units, such as cranes, power shovels, draglines, etc., that are powered with Diesel engines. This trend was particularly noticeable in the units purchased in 1944, and the indications are that still more of these to be purchased in 1945 will be so powered.

Work Equipment Has Caught On

Among the striking facts that will be disclosed by any study of work equipment are the continued expansion of its use almost since its inception, and that despite the heavy purchases that have been made in each of the last eight years, which have totaled 47,773 units, there is still a real shortage in practically every type of equipment and on practically every road, except in motor cars which, incidentally, are bought in larger numbers than any other type. This statement can be confirmed in several ways, the most convincing of which is that while many of the budgets for 1945 have not yet been completed, information at hand indicates quite clearly that the purchases for this year will exceed those for 1944 and previous years. It should be kept in mind, too, that both power machines and power tools are being used more intensively than in any previous period, so that the demand for additional equipment will be increased measurably by the need for replacement.

Second-Hand Equipment Helps

During 1943 and again in 1944, a number of roads that were unable to get all of the equipment that they needed from manufacturers, turned to contractors who had been engaged in the construction of various government projects, and obtained a number of second-hand units, principally of earth-moving equipment. While this was done on a relatively small scale for emergency reasons, a great deal of caution should be exercised in the purchase of second-hand equipment in the future, especially at the close of the war, when the army, in possession of a large number of power machines, principally earth-moving units and cranes, will endeavor to dispose of them. In considering the purchase of any such equipment, it should not be lost sight of that much of it will be out of date, while most of it will have shortened life as a result of abuse by inexperienced operators, often under extremely severe conditions.

Whence the Money?

(*Continued from page 11*)

contribution to the military defense of the nation. For the railroads to keep pace with the industrial advancement of the country is, thus, a military as well as an economic necessity. If capital adequate to this purpose cannot be obtained from uncoerced private investors, there are evidently but two alternatives, (1) the removal of the political conditions whereby capital is provided for alternative forms of transport free of obligation on the part of the users thereof to pay compensatory charges; or (2) the financing of improvements and additions to railroad fixed property by coerced investment, that is, through taxation—the way highways, waterways and airways are financed.

Warning from Metzman

These alternatives were realistically discussed by Gustav Metzman, president of the New York Central, in an address on December 18 at Detroit (which, incidentally, is the principal focus of business interests seeking to expand socialistic financing of transport's fixed properties). This address was reported in the *Railway Age* of December 23, and in it Mr. Metzman set forth what might be called a formula for the financing of government-owned transport plant on a basis which would permit the continued private financing of the railroads. He said in part:

"If our government-owned transport plant—superhighways, waterways, and airports—were made really self-supporting, then these developments could be made free from appropriations and from politics. Greater use of them would automatically increase the financial returns—and provide a basis for financing additions and improvements. If this were done, private investment in railways could live alongside government investment in highways, waterways, airports, and airways. Unless some solution like this is acceptable to the American people, I do not know how the railroads can get along without public aid, and still provide the service the nation needs, in peace and war."

National Interest Requires Modern Railroads

Other recent testimony on the railroads' need for extensive, prosperity-making improvements, appeared in the December, 1944, issue of the magazine "Fortune," which analyzed in detail the post-war improvements in its plant which the Rock Island would like to make. Projecting these findings to the railroad industry as a whole, "Fortune" concluded that capital improvements on the order of $5-$10 billions should be made by the railroads in the years immediately following the war (that is to say, capital improvements of just about the magnitude which actually were made during the 1920's, following the previous World War).

The needs of the military services and industry for efficient railroad transportation being what they are, it seems probable, therefore, that even the long-run prospects for extensive and continued improvements to railroad plants are rather bright—but it cannot now be predicted that these will be possible through the uncoerced investment channels of the private capital market. The short-run outlook for extensive railroad betterments, as soon as a cessation of hostilities makes them possible, without dependence upon socialistic expedients to finance them, appears excellent, for reasons set forth in the earlier part of this discussion.

10-YEAR HIGH

in shop equipment buying

REPORTS which are coming in from various sources show that during the year 1944 there has been more activity on the part of the railroads in the machine-tool and shop-equipment field than has been evident for many years in the past. There are also indications that this activity will continue for months to come. There are several logical reasons for this condition of affairs. First and foremost among these is the fact that the railroads have been out of the shop-equipment market for many years and, particularly during the last two years, have been wearing out machine tools and shop equipment at an accelerated rate. The combination of wear and obsolete equipment has probably been as much responsible for the sudden buying spurt as any other factors.

There are, however, other important considerations that influence the roads to invest part of their earnings in new facilities. Acquisition over a period of some ten years of a substantial number of large modern steam locomotives, most of which are equipped, in part at least, with roller bearings has had a decided influence on the ability of the heavy repair shops to overhaul power with the degree of accuracy required in modern locomotives. The large number of Diesel-electric locomotives, of both road and switching types, that have gone into service in the last five years has made it absolutely necessary to build and equip many new facilities for both light and heavy repair work on this type of power. The stepping up of shop operations involving the internal-combustion locomotive and its electrical equipment has brought into the sphere of shop equipment many items heretofore more or less unfamiliar in the railroad field.

Certain factors related directly to operation have also had their influence. Not the least of these is high speed. High speed, coupled with heavy loads and the necessity for stopping heavy trains moving at high speeds, has been instrumental in creating a wheel problem on practically every railroad. The character of work which it is necessary to do in the average wheel shop today, whether it be for cars or locomotives, is such that it demands a type of shop equipment far superior to that with which

By H. C. WILCOX
Associate Editor

The year 1944 witnessed more activity in railroad machine tool and shop equipment purchases than in any year since the late '20's and the indications are that plans for the modernization of shops on many roads are going to require the replacement of substantial quantities of obsolete units. High speed, heavy loads and a traffic rate far above normal have been responsible for wearing out shop equipment in months where it used to take years. The importance of adequate shop and engine-terminal equipment assumes major proportions when it is realized that the character and the capacity of these facilities may be the controlling factor in a railroad's ability to get out of modern motive power and cars service of which they are capable.

the railroads have been getting along for many years. Roller-bearing axles on both locomotives and cars have had their influence on the type of wheel-shop equipment which is needed. It is not surprising that foremost among the demands on the part of practically all roads is that group of machine tools, plus handling facilities, which go to make up a modern wheel shop

Every shop needs to, and wants to, increase output and, particularly during the past two years when the skilled shop forces have been rapidly depleted as a result of the demands for men in the armed services, this question of output has assumed serious proportions. Unlike many other industries which, because of the peculiar nature of their operations, have kept their plants constantly equipped with up-to-date machinery the railroad shop has been unable to take advantage of many of the new developments in cutting tools and tooling equipment simply because the physical condition and power characteristics of obsolete machine tools made the adoption of these new developments impractical.

Equipment Need Acute in '43

Early in 1943, at a time when machine-tool and shop-equipment manufacturers were still involved in equipping defense industries and when the railroads were still handicapped by the lack of a high enough priority to get needed machine tools and shop equipment, the *Railway Age* conducted a survey to determine whether the machine tool and shop equipment manufacturers were in position to supply the needs of the railroads and what the attitude of the railroads was toward the acquisition of new shop equipment. A questionnaire was sent to a group of 40 railroads representing 73 per cent of the route mileage and more than 80 per cent of the motive power and equipment ownership of the United States but selected geographically to represent all sections of the country. The response from this group showed conclusively that the railroads not only needed new shop equipment to carry on their wartime operations but that the need was sufficiently acute to warrant every effort being made to get it immediately.

Replies to various questions in this survey showed that of all the needs the replacement of equipment in the car-wheel and locomotive driving-wheel departments was most important. Closely following was the need for rehabilitating the turret-lathe departments as well as those departments devoted primarily to rod, piston and crosshead work. The outstanding demands for machine tools by types were, as usual, for engine lathes, turret lathes, drilling machines and grinding machines, followed by a group of heavier machines such as vertical and horizontal boring mills, milling machines, planers and shapers.

Reports of purchases received by the *Railway Age* for the year 1944 of the machine tools actually acquired by these same 40 railroads were as follows, listed in the order of importance on the basis of the number of units purchased:

(1) Grinding machines; (2) engine lathes; (3) drilling machines; (4) horizontal turret lathes; (5) shapers; (6) hydraulic presses; (7) vertical turret lathes; (8) horizontal boring mills; (9) planers and horizontal milling machines and (10) knee-type milling machines. In the next group of machines were: car-axle lathes, car-wheel lathes, car-wheel grinding machines, vertical boring mills for wheel and tire work, locomotive tire-turning lathes, quartering machines and locomotive journal lathes.

Within the past two weeks inquiries have been sent out to the same group of 40 railroads requesting information concerning machine tools on order but undelivered, as well as the departments involved in improvement programs for the coming year. Those roads which reported up to the time of the closing of this issue indicated continued activity in the replacement of equipment in locomotive driving-wheel shops, car-wheel shops, as well as in turret-lathe departments and those shop departments having to do with locomotive running gear work, such as rods, pistons and crossheads. The reports from these roads as to the character of machine tools still on order and planned for 1945 show that the same types purchased during 1944 dominate the remaining needs of the railroads. Only five of the roads reporting stated that no definite programs for shop rehabilitation were in prospect for the coming year but of these, three roads specifically stated their machine-tool and shop-equipment replacement policies were to acquire annually such equipment as would assure keeping their repair plants up to date in the matter of tools.

In looking over the list of purchases of approximately 100 railroads, large and small, one is impressed by the great variety of things which a railroad needs in the normal course of a day's work to maintain the more than 40,000 locomotives and 2,000,000 cars that handle the nation's traffic. There is hardly an item of mechanical equipment, of whatever nature, that is not bought and used somewhere at some time by the railroads in the conduct of transportation.

An Engineering Approach Needed

As unusual as may be the present activity in shop-equipment buying by contrast with the 10 years preceding the war, most of the railroads find themselves in a difficult position with respect to their ability to improve shop output and reduce the costs of maintenance. In spite of an excellent cash position their lack of definite improvement policies in the matter of shop and engine-terminal facilities over a period of years has been responsible for a vast accumulation of obsolete equipment, housed in many cases in shop structures that were built years ago when a far greater number of locomotive units

had to be put through the shop at more frequent intervals. The result of all this, which we are witnessing today, is that we have shops poorly suited to present-day needs, in which the high cost of handling heavy parts is occasioned by the inability to arrange and re-equip departments in such manner as to take the greatest advantage of modern cost-saving facilities. If some accident of fate should make it necessary for many railroads to cut their shop floor space in half and do the necessary things to modernize the remainder, the chances are that the cost of doing work would be materially reduced.

This condition is responsible, in many cases, for indecision in the matter of shop improvement programs. Most railroads do not have any such programs, except in name. That which is needed most today is a thorough engineering study of the problem of equipment maintenance. The character of this problem has changed drastically in the last five years but our thinking, in the matter of repair facilities, is still much along traditional lines.

It is not surprising that railroad managements at times have difficulty in trying to decide whether or not a million dollars will return most in value if invested in shop equipment, new locomotives, new cars, roadway improvements or in some other facility. Each department of a railroad, engrossed as it is and should be, in its own peculiar problems, can, as a rule, put up a pretty strong argument to the management for the necessity and justification for its requests for appropriations.

Those departments most successful in maintaining the modern character of their facilities are probably those which have the most complete and factual data coupled with executive personnel who have that rare ability to sell management the idea of spending money to make money.

Collateral Facilities Needed

If there can be attributed to railroad managements any defect in their present course it is in allowing things to take their course for by this process, on many roads, the cost of maintaining equipment is not being reduced at a time when there never was so much available in the way of modern facilities for accomplishing that very purpose.

Many railroad managements are prone to look outside their own organizations for assistance in the matter of improvement programs. The difficulty in this is that there is nowhere to go to get the help. It has to come from within and it is a problem that can be approached only from an engineering standpoint—not mechanical engineering alone, nor civil, electrical or production engineering alone, but a combination of these several approaches to a problem that involves all of them. For, railroad operation today is a complex job in which it is quite possible to spend millions for a facility of one type and be denied the real value of that facility because of the failure to provide collateral facilities with which to keep it in service. The true facts of the equipment-maintenance case are that maintenance facilities *have not* kept pace with the equipment itself and it is time that management recognizes this.

* * *

Is Your Trip Essential?

Herb Roth in the Delray Beach News (used by permission)

More than 9,000 Mexican Nationals Were Employed in Track Work on the Santa Fe During 1944, Making Up the Bulk of That Road's Track Forces

labor NEEDS *still exceed supply*

Some progress is being made but shortage of men still limits the railways' war efforts—All departments affected

BY THE CHICAGO STAFF*

MAN-POWER continues to be the railways' most pressing problem. On November 1, shortages totaling approximately 90,000 employees were reported by 188 railways. Alarming as these figures are, when compared with the 117,000 men it was estimated were needed on November 1, 1943, they indicate that some progress has been made toward alleviation of this condition. The present total employment of 1,500,000 persons by the railroads represents a net increase of approximately 500,000 over the employment of December 15, 1941, including replacements for the 280,000 men now in the armed services. During this period the Railroad Retirement Board has furnished in excess of 1,200,000 new employees. Actually it is probable that the railways have been forced to recruit close to 2,000,000 new employees, but no definite figures are available.

The employment of Mexican nationals in railway work has been one of the most effective means of reducing the man-power deficiency. Beginning in August, 1943, these men have been employed in increasing numbers for maintenance of way work, and to a lesser extent in other departments. There has been a definite relationship between the total of Mexican workers employed on U. S. railroads and the size of the existing labor shortage, as shown by the chart.

Normally employed only for office work and lighter manual occupations, such as coach cleaners, women have been another important source of new employees, 116,428 being employed as of July 15. Many railroad general offices are now almost entirely made up of women workers; and, in addition, they have been used on heavier jobs in all departments. There are many employed as ticket collectors and flagmen on suburban trains and as waitresses and cooks in dining cars. Others are in maintenance of way or equipment work, while still others are employed as freight handlers. One line even reports using women as yard brakemen. Some efforts have been made to use American born citizens of Japanese ancestry, but due to objections of railway labor organizations and many of the communities where assigned, few have been used.

The Labor Shortage

Many roads have employed townspeople on their off-days for track or freight station work. General office employees have also been used in freight houses on their off-days. High school students, when properly supervised, have been employed on track work and in freight stations during the summer vacation period with considerable success.

In some of the larger cities freight truckers have been obtained from among the "floaters" by sending trucks each morning through the area which these people frequent and recruiting them on the spot. The employment of this class of labor presents a serious problem to rail-

* By N. D. Howard, E. L. Woodward and C. C. Robinson.

The herculean efforts of the railroads and the Railroad Retirement Board to overcome the mounting man-power deficiency are described in this article. That these efforts have not been entirely unsuccessful is shown by the fact that the total shortage of 117,000 men reported at the close of 1943 had been reduced to 90,000 men by November 1, 1944, in spite of further increases in traffic and continued loss of men to the armed services. The improved national situation, however, does not reveal the seriousness of the position of the western roads which are having to hold trains in terminals and leave switch engines idle due to lack of crews to man them; neither does it reveal the almost desperate efforts of maintenance of way officers to maintain safe tracks with greatly understaffed gangs of inexperienced men. Selective service continues to drain many of the most competent young craftsmen from railway shops and engine terminals, but mechanical supervisory forces have remained relatively stable during 1944.

road police departments, but with proper supervision it can be used successfully.

The table shows the latest figures of the shortage of operating department employees. Attention is directed particularly to the shortage of telegraphers. These men share responsibility through the proper receipt and delivery of train orders for the daily movement of thousands of trains of vital war materials and the lives of thousands of persons. Nearly every railway has established a training school for telegraphers, but these efforts have not been sufficient, in spite of everything they could do, as is indicated by the figures. Months are required to train a proficient telegrapher and years are required to make a train dispatcher. Experience has shown that efforts to teach men telegraphy after they have attained 30 years of age are largely ineffectual, yet the drain to the armed services of the younger telegraphers, the only group in which it has been possible to train telegraph operators, continues. If the railroads are to continue the safe and efficient movement of passengers and freight they have so far accomplished, they must be permitted to train and hold sufficient young men as telegraphers and train dispatchers to fill the present shortage.

Shortage in the Mid-West

Geographically the Mid-West showed the greatest shortage of employees with other regions following as shown:

	Nov. 1, 1944	Nov. 1, 1943
Mid-West	20,041	28,220
Far West	16,529	20,780
Northwest	15,072	19,150
Southwest	15,009	17,450
East	14,642	23,800
Southeast	9,022	7,600

While there have been marked reductions in the labor shortages in the East and Mid-West, there has been a decided failure to bring about any great improvement in other regions. There is every indication that the rapidly mounting burden of military traffic now falling on the western roads will be greatly augmented during the coming year; and inability to bring marked relief from present railway man-power shortages in the three

Operating Department Labor Shortages by Job Classification

(For 188 Selected Railways)

As of November 1, 1944

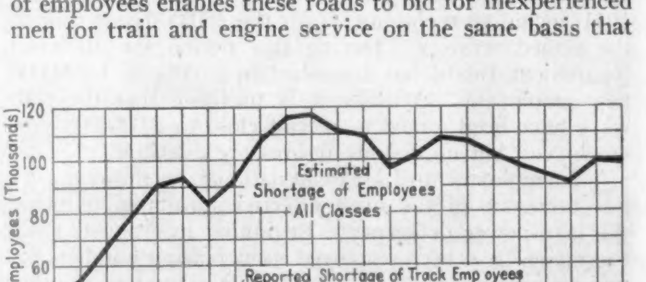
Agent, Station	249	Laborer, stores	888
Baggageman	89	Mail, baggage & express handler	821
Brakeman	2,982	Motorman	12
Clerk, Miscellaneous	795	Porter, sleeping car	293
Clerk, Station and Yard	751	Porter, train	15
Conductor	156	Porter, station	139
Cook	155	Steward	36
Crew dispatcher	48	Switchman	3,139
Engineman	58	Switchtender	135
Fireman, locomotive	1,032	Telegrapher	1,309
Flagman, crossing	180	Towerman	108
Freight handler	3,072	Train dispatcher	21
Hostler	45	Waiter	362
Kitchen helper	286	Watchman	22
Laborer, miscellaneous	3,035	Yardmaster	2
Laborer, station	587		

western regions is of grave importance to the nation as well as to the roads themselves.

The lack of satisfactory progress toward a solution of the western lines man-power problem primarily is due to the rapid traffic increases on these lines. In addition, the Pacific Coast lines were forced to compete in an area in which the surplus labor had been absorbed by war plants before the tremendous rail traffic increases had much more than started. In these three regions during November, 1944, 814 trains were held in terminals two hours or more awaiting crews. During the same period 1,644 switch engine assignments were not worked for lack of men. The results of such conditions are cumulative, bringing about rapid increases in terminal congestion and serious delays to trains and cars of vital war materials other than the ones immediately involved.

Housing Difficulties

Many of the western lines have been forced to recruit man-power in other regions. Nearly all of these have used their on and off-line traffic agencies as employment offices, while some have also established employment bureaus at off-line points. The War Manpower Commission has assisted many of these railways by granting them inter-regional "A" priorities for brakemen, firemen and switchmen, the same as is given most so-called "war industries." In this connection, it should be pointed out that both the Railroad Retirement Board and the War Manpower Commission endeavor to hold experienced railroad men in railroad service. These men are not given referrals to other industries until they have refused all offers of railway employment. The granting to the Western lines of "A" priorities covering certain classes of employees enables these roads to bid for inexperienced men for train and engine service on the same basis that



Relationship Between Total and Track Employee Shortages and Employment of Mexicans in Railway Service. From U. S. Railroad Retirement Board Data

"war industries" bid for trainees and apprentices. It also gives these railroads preferences over other lines in the hiring of experienced train and enginemen.

Recruiting of man-power in outside regions has presented the railways on the Pacific Coast, particularly in the San Francisco-Oakland Bay area, with a difficult housing problem. Many new employees have refused to remain on the Pacific Coast because they were unable to find adequate living quarters for themselves and their families. Active steps to meet this situation have been taken. Most lines have established trailer camps or built portable houses for men with families. For single men and for trainmen at away from home terminals hotel floors have been rented, dormitories built, and in one case, at least, an entire hotel was purchased. The co-operation of the War Housing Commission has been secured and in several communities large numbers of houses or apartments have been set aside for use by railway employees and their families.

Maintenance of Way Forces Far Short

For the third consecutive war year, the maintenance of way and structures forces have been hard pressed for the labor necessary to keep their tracks, bridges, buildings and other facilities abreast of the peak service demands that have been made on them, a situation that has been made the more serious by the concurrent restrictions that have existed on the procurement of many essential materials and on certain types of equipment designed to speed up work operations and reduce the strain on manpower. The peak in the unfilled labor needs of the maintenance forces was reached in October, 1943, when the Class I roads reported their maximum unfilled needs at approximately 54,000 men, but that the situation was little less serious during 1944 is seen in the fact that as of August 1 of that year these same roads showed needs of 41,566 maintenance department employees, and still needed approximately 38,800 such employees on November 1.

What the situation will be in the year ahead, at least until the collapse of Germany, is anyone's guess, but with General Eisenhower calling urgently for more shells and small ammunition, with the War Manpower Commission asking for more than 300,000 additional workers to bring the nation's war program up to schedule, and with Lt. Gen. Brehan Somervell, commanding general of the Army Service Forces, predicting, as he did on December 6 last, that it will cost $71,000,000,000 a year to fight Japan after Germany is defeated, the railway labor situation in the months immediately ahead, and particularly in the maintenance of way department, is not very promising.

Greatest Need Among Trackworkers

To a large degree, to date, the importation of Mexican Nationals for work on tracks has saved the day for the maintenance forces, and is certain to have an important bearing on the labor situation among these forces in the year ahead. Important too, in this regard, has been the thousands of high school boys who have thrown in their lot with the track forces during the summer months, to accomplish much work which could not have been done otherwise. Not to be overlooked has been the widespread recruiting efforts of the Railroad Retirement Board, designed to channel into railroad work every available man with previous railway experience, as well as thousands of other workers for which there were not priority claims by out-and-out war industries.

The greatest need of the maintenance forces continues to be in section and extra-gang laborers, and not only in and about terminal and industrial areas, but also in some of the most sparsely settled parts of the country. As of August 1, 1944, the Class I roads reported needs of 27,812 sectionmen and 9,184 extra-gang laborers, in spite of the large-scale employment at that time of Mexican Nationals and high school boys in both these categories. On November 1, in spite of the approach of the winter season, with the normal closing down of much track work in the northern part of the country, they still reported needs of 24,464 sectionmen and 9,464 extra-gang laborers, and it is a certainty that these needs will not recede much further during the present winter months as most roads will continue to carry forward as much effective work as possible. Furthermore, it can be expected that they will rise sharply in the early spring with the reopening of the working season.

As of November 1, the largest requirements for track workers were in the Southwest, where the total needs were reported as 7,938, and in the Northwest and Great Lakes areas, in each of which the needs were set at approximately 6,800. Roads in the Pacific Coast area reported needs of only 4,371 trackmen, about the same number reported as needed in the Northeast, and roads in the Southeast, as previously showed the smallest needs of approximately 3,500. Similar needs in these territories reported on November 1, 1943 were as follows: Southwest—8,557; Northwest—9,351; Great Lakes—13,424; Pacific Coast—5,963; Northeast—7,420; and Southeast—3,606.

More Than 23,000 High School Boys Hired Out to the Railroads for Work on the Tracks During the Last Summer, and Accomplished a Large Amount of Essential Work

American Indians, at Work on the Track on the Denver & Rio Grande Western

In some of these territories section gangs continued to be stripped of practically all of their men except the foremen, and extra gangs have been so small as to preclude much effective large-scale work, even when filled out with all available sectionmen. In fact, many roads are in need of section and extra-gang foremen, the total needs of the roads in this regard as of November 1 being 94, and not a few are experiencing a shortage among their other track supervisory officers, a situation which reflects the reduced experience and lower caliber of their track forces generally, within which there is a dwindling supply of men capable of assuming supervisory positions.

Mexican Nationals to the Rescue

Although the needs of the track forces, numerically, far outnumber those of the other forces in the maintenance of way and structure departments, including the bridge and building forces, the needs among these other forces are as great relatively and the effect of their deficiencies is no less serious, because, to a greater extent than in the track forces, these deficiencies reach into the skilled and semi-skilled classifications. As of November 1, 1944, the Class I roads reported needs for 1,370 bridge and building carpenters and carpenter helpers; 1,721 bridge and building apprentices, helpers and laborers; 187 bridge and building mechanics and mechanics' helpers; 165 ironworkers and helpers; 210 bridge and building painters and helpers; and 147 water service repairmen, mechanics and helpers—a total of 3,800. By comparison, the corresponding needs of the roads as reported a year earlier were 1,760 bridge and building carpenters and carpenter helpers; 2,034 bridge and building apprentices, helpers and laborers; 105 bridge and building mechanics, helpers and apprentices; 28 ironworkers and helpers; 282 bridge and building painters and helpers; and 187 water service repairmen, mechanics and helpers—a total of 4,396.

During 1944 thirty-two roads availed themselves of the opportunity to bring Mexican Nationals into the United States for unskilled work under agreements between the state departments of the two countries—agreements which now permit importations to the extent of maintaining a force of 50,000 such workers in the United States for work exclusively on the railroads. To December 2 last, total entries of these Mexican Nationals reached 75,606, and as of that date there were 38,740 at work on the railways, about 90 per cent of whom were engaged in track maintenance work.

Almost universally, following an initial adjustment period in some instances, the roads are now finding their Mexican employees an invaluable adjunct to their track forces, and the Mexicans themselves are becoming much better adapted to the conditions under which they are being employed. As might be expected, with contracts covering a period of only six months, there is a considerable turnover among the Mexicans, many of whom return to Mexico upon the termination of their contracts. However, the records show that even among those who do not renew their contracts immediately, a sizeable number reapply subsequently for work on the American railroads and return to that work with the benefit of their previous experience.

High School Boys Make Good

The history of the war-time importation of Mexican Nationals into the United States for unskilled classes of work on the railways, and the details of the contractural agreements under which they are being employed, were presented in an article which appeared in the issue of the *Railway Age* for June 10, 1944, page 1112.

Encouraged by the successful use of high school boys in track work on a number of roads in 1943, many additional roads recruited such boys for the first time for such work during the summer of 1944, and others enlarged their efforts in this regard. As a result, with stimulus furnished by the Railroad Retirement Board in conducting promotional and educational campaigns among railway officers and high school and state labor authorities, and among the boys themselves, more than 23,900 boys hired out to the railways between May 1 and September 30, a large part of whom worked continuously throughout their summer vacation period, with some still returning to work on the tracks weekends and holidays.

Under especially careful supervision, this program of employing high school boys proved a success on most roads, and while it was never expected that the output of the boys, as a whole, would equal that of experienced full-grown trackmen, it is generally conceded that they produced effective results, in many cases comparable to those produced by the regular track forces, and not infrequently greater than those produced by other classes of inexperienced labor employed in similar work.

Repeated references have been made in previous issues of the *Railway Age* to the employment of these high school boys in track work, but the most recent and detailed article, reviewing the favorable experience of the Pere Marquette in the employment of such boys during the last summer, appeared in the issue for December 9.

Other Expedients Adopted

Continuing their efforts to overcome their shortage in man-power, a number of roads have employed women in maintenance of way operations, although there has always been general recognition of the fact that roadway maintenance work is essentially work for men. However, only a small proportion of the large and increasing number of women being employed by the railways has been for maintenance of way department work, records compiled by the Interstate Commerce Commission showing that, as of July 15, 1944, the last date for which figures are available, there were a total of 2,746 women employed in maintenance of way and structures work, exclusive of those employed in offices and as crossing watchmen. Of this number, 1,456 were classified as sectionmen and 1,089 were classified as extra-gang workers.

In a further effort to enlarge their track forces, a number of roads, notably in the West and Southwest, have been employing American Indians from government reservations, and the number being employed is on the increase. While the total number involved is relatively small in comparison with the number of other special workers that have been hired to fill out the track forces, reaching a maximum of only about 6,000 during 1944, and while the employment of Indians has entailed a number of special considerations on the part of the roads employing them to keep them satisfied and on the job, they have proved an important factor in some territories. In fact, their employment could, no doubt, be made a still more important factor, especially in the South and Southwest, if replacements could be found for an additional large group, now unemployed, who have evidenced an interest in track work.

The expectations of some that Japanese-Americans from relocation centers, and prisoners of war, especially Italians, would form a large reservoir of labor for work on the tracks, has not materialized. The few experiments made in the employment of Japanese-Americans have met with disfavor in most communities, and both American labor and the War Department have frowned upon the employment of war prisoners in railroad work. Up to October 31, 1944, approximately 10,680 returned war veterans had accepted employment on the railways, but only a relative few had entered roadway or structures work.

Looking ahead, the labor situation in the maintenance of way and structure departments is far from encouraging, not alone as viewed from the present needs of nearly 39,000 workers, and the prospect that this number will increase as the summer work season opens up and gets under way, but also because of the over-all labor demands of the country, and especially of war industries, which far exceed the available supply. Furthermore, through the severe losses of their younger, more energetic and experienced men to the armed forces and to other war industries, with replacements largely by boys, older men, and others largely without previous railroad experience, the average productivity of those who remain in maintenance of way and structures work is far below prewar level.

Mechanical Labor Conditions Slightly Worse

Labor conditions in railway shops and engine terminals were covered quite fully in this article a year ago and showed that equipment maintenance and conditioning work was being definitely handicapped by labor shortages in practically all categories of skilled and unskilled help. This condition was accentuated during 1944 and the conditions are, if anything, slightly worse as the railroads enter into the coming year.

There has been no increase in the supply of mechanics and laborers available for use on most roads. About the same number of women are now employed as compared with a year ago, and, for some types of work and in some localities, this kind of help has worked out quite satisfactorily. More than average physical strength and stamina are required, however, for most classes of railway work now being done by women and unless women have this characteristic they can seldom be successfully employed.

In general, the railroads are employing a somewhat larger number of Mexicans in connection with mechanical maintenance work and the results secured are definitely better than was the case a year ago. This is largely due to the fact that, on the basis of past experience, better judgment was exercised in selecting the type of Mexican labor contracted for during last year.

The Selective Service Act continues to drain many of the most competent young craftsmen from railway shops and engine terminals, one road, for example losing 50 men a month or 600 men during last year. In general, mechanical supervisory forces remained quite stable during 1944, with some notable exceptions. A few supervisors were given up by the railroads, in response to the urgent need for more competent supervision in defense plants, and some higher mechanical officers, including at least one department head, were granted leave of absence to enter military service.

An examination of the latest report of the United States Railroad Retirement Board shows that in November, as compared with the preceding month, shortages of skilled trades journeymen and helpers and apprentices increased 3.9 and 3.3 per cent, respectively. The major part of these increases reflected greater need for workers in shop occupations. Crafts in which the greatest shortages existed included machinists, boilermakers and sheet metal workers. More apprentices and helpers in each of these crafts were badly needed, and shop laborers.

ELECTRICAL *potentials*

Electrical developments applicable to railroad service are accumulating at such a rate and are of such importance that some cannot wait for a post war release of materials.

By ALFRED G. OEHLER

Electrical Editor

THREE applications of electrical equipment to railroad service are being given special attention by engineers and operating men. They are respectively, air conditioning and lighting for passenger cars, maintenance facilities for Diesel-electric locomotives, and train communication.

Orders for more than a thousand new passenger cars have been placed, pending the release of material for their construction. The first break in the situation was the release of material for 40 aluminum and 15 steel passenger cars to be built at the American Car and Foundry Company's plant, St. Charles, Mo. Estimates of cars to be built range from 2,000 to 3,000 cars per year for a period of five years. Many existing cars will be modernized, but in nearly all cases, whether it is a new or a rebuilt car, additional lighting and air-conditioning equipment will be required.

New and novel types of car interiors have been planned and an even greater number of lighting units and lighting designs have been produced, some of which have been prepared as models for exhibit and trial.

One manufacturing company has announced its intention to return to the field of power generation and conversion and has produced a 20 kw. axle-generator drive and a high-speed, motor-generator for converting 64-volt d.c. power to 110-volt a.c. for fluorescent lighting. Others are developing vibrating inverters for producing alternating current, and one is making a vibrating-type booster for raising 32 volts d.c. to 64 volts d.c. Other improved axle generating equipment will also be available, as will also new and improved engine-driven generators.

Among the betterments being made available for air conditioning are improved and simplified controls which equalize the cooling and heating over the area in the car, which reduce variations in humidity, which compensate for changes in outside conditions and which do not leave adjustments as a responsibility of the trainmen. Better evaporators, condensers, and motor- and engine-driven generators will also become available.

Recent improvements in water cooling of condenser units hold promise of reducing the required power consumption, particularly in the hot dry sections of the country. Electrostatic filters will also contribute to the disposal of the ever-present problem of keeping dirt out of the cars.

Diesel-Electric Maintenance

Diesel-electric locomotives require two classes of service, namely, routine servicing and periodic inspections which include I. C. C. monthly and annual inspections and all necessary repairs or replacements of parts. The facilities required vary with the extent and type of operations and also with the management's conception of how the work should be done. At one end of the scale is the railroad which does most of its maintenance on a parts-replacement basis with the manufacturer or the outside repair shop supplying new or reconditioned parts, and at the other is the railroad which performs all the work required, to and including the rewinding of motors and the rebuilding of damaged cores. A recently completed example of the all-railroad maintenance procedure is that of the Rock Island shop described in the November and December issues of Railway Mechanical Engineer.

Although Diesel-electric locomotives have been in service on American railroads for 20 years, there has been no urgent and widespread need for electrical maintenance facilities until recently. Depreciation of electrical equipment in switching and transfer service is relatively small and in the early years of Diesel operation most of the

Electrical Shop for Diesel-Electric and Multiple-Unit Car Maintenance

service was iimited to this field. It was not until about 1940 that many Diesel-electric locomotives were used extensively in high-speed passenger service and electrical maintenance became really important.

Those roads with a background of experience with electric locomotives and multiple-unit electric cars were fortunate since a Diesel-electric is essentially an electric locomotive with the addition of a self-contained power plant. Roads without this experience have been obliged to extend themselves to meet the situation. In the interim period the manufacturers have been extremely helpful. At least six Diesel shops which will include electrical repair facilities are now proposed or under construction.

It appears now that the use of Diesel-electric locomotives will be considerably extended in the near future, and if the much-talked-of gas-turbine locomotive finds a place in the railroad field, there will be added need for electrical maintenance facilities. It seems unlikely that a well-developed locomotive of this type may be available in less than five or six years, but it is interesting to note that engineers speaking on the subject at the recent annual meeting of the American Society of Mechanical Engineers were generally agreed that electric transmission should be used in the development of such a locomotive.

Train Communication

End-to-end, train-to-train and train-to-wayside communication, after about 20 years of development work, has suddenly appeared as one of the most important railroad electrical potentials. Two types of apparatus are available, namely, the inductive or carrier systems which use wayside wires as guides, and the space radio systems which offer communication through space for limited distances, using very high or ultra-high radio frequencies.

Several railroads have made limited use of the inductive system for several years, but only within the last few months the Pennsylvania has contracted to equip two, four-track divisions involving 245 miles of line, the Kansas City Southern has announced a plan to install train communication on 560 miles of line, and the Atlantic Coast Line has ordered equipment for 234 miles of line. These installations will all employ inductive or carrier type equipment.

Experiments with radio telephone have been made extensively during the past years and results obtained indicate that it will prove to be a satisfactory means of train communication. Its use has not been adopted by any railroad since its application involves the granting of channel assignments by the Federal Communications Commission and its successful application will be materially aided when the U. S. Navy is able to release what is now secret military information. The railroads have applied to the Commission for channel assignments and an early allocation is anticipated.

It is now quite evident that train communication will soon be widely accepted as an important adjunct to railroad operation, and whatever systems is used, it is evident that the necessary power supply must be provided on the locomotive and the caboose. On the locomotive, the need can be met by using a sufficiently large or an extra turbine-generator set. On the caboose, the need can be met by using storage batteries of sufficient size with charging facilities at terminals.

This was the procedure employed when electric car lighting first came in vogue but it seems probable that, as in car lighting, the straight storage system will be replaced eventually by others which either receive power from the car axle or from an internal combustion engine-driven generator. Several types of axle generators in sizes up to 3 kw. are now being tried out. In developing these units, the importance of adherence to voltages now in use for car lighting and air conditioning should be recognized.

Lighting

In the field of general lighting applications there is a constantly increasing amount of work to be done. Since the period of the dimout, there has been a reluctance to improve old or make new installations, and this situation has been increased by the difficulties involved in obtaining materials. A further complication arises from the fact that much of the wiring material now available does not conform with code requirements and will have to be replaced when accepted materials again become available. Codes have been relaxed for the war period, and while some of the concessions may become permanent, most of the original code requirements will undoubtedly be reinstated.

Many railroad lighting requirements present unusual difficulties, but the value of good lighting is now widely accepted, and it is to be expected that every effort will be made to bring railroad applications up to the quality levels found in manufacturing. Enginehouse lighting represents one of the most difficult problems and this subject has recently been given special consideration. A few enginehouse stalls have been equipped with experimental fluorescent lighting with very satisfactory results. Yard lighting which is also difficult will be given attention when it becomes possible.

A new and difficult lighting requirement is that for the Diesel maintenance shops in which work is done on three levels: on the running gear and underneath, under the side work platforms, and on top of the locomotive. There is also much need for good general shop illumination used in combination with appropriate local lighting. New forms of light sources are being made available in the form of the Slimline of fluorescent lamps which are made in lengths from 42 to 96 in., having efficiencies as high as 65 lumens per watt. While they were originally conceived as show-case lamps, they will undoubtedly find application for cove lighting in stations and offices and may also be used for car lighting.

Other Potentials

One of the greatest potentials for electrical applications to railroad service is electric traction. Its use is limited to heavy traffic lines and its application requires large initial capital expenditure looking toward its continued use over a period of years, but in this connection a few observations seem pertinent. The railroads are carrying enormous traffic, much of which is expected to continue for years to come. Their financial condition is good and the carrying of some of the traffic peaks with steam power has become a major problem. Electrification is independent of the type of fuel used and within a short time the power supply companies will have a surplus of power. Electrification studies have been made and are in progress and their consummation is more than a possibility.

Public address systems have had limited application in large passenger stations, but their quality has been improved and their value recognized to such an extent that they are now being applied extensively to smaller stations, to transfer and loading platforms, to freight classification yards, and most recently to use in a freight house to facilitate the handling and loading of l.c.l. freight.

New insulating materials such as the silicone resins

(*Continued on page 114*)

M. R. S. *prepares for Berlin drive*

Army-operated French railroads have been rehabilitated and are the backbone of the supply system supporting the fighting troops. Army railroaders' home training shows up in spectacular performance

By C. B. TAVENNER
Associate Editor

By the end of 1944 the Army Transportation Corps had procured and shipped overseas some 4,000 American-built locomotives and 60,000 freight cars. Its personnel was active in every theater of land operations in this world-wide war. Its duties and responsibilities were varied, but a particularly vital part of its job was being performed by the units making up the Military Railway Service, through whose skill and sweat the battle lines have been kept supplied over the railway lines in each area of major operations. Old hands from American railroads and nonchalant youngsters schooled in M. R. S. training camps have teamed up together in some 105 units, consisting of about 2,000 officers and 42,000 enlisted men, and have proved themselves capable of meeting any sort of railroad problem in any part of the world.

IN its performance overseas in 1944, the Military Railway Service has abundantly proved the value of its months of preparation for the job of keeping the supply lines open and materials of war moving forward to meet the demands of the battlefront. Through such performance American railway men and railway materials have played their part in bringing victory nearer, and in pushing the war closer and closer home to the enemy in every area of conflict.

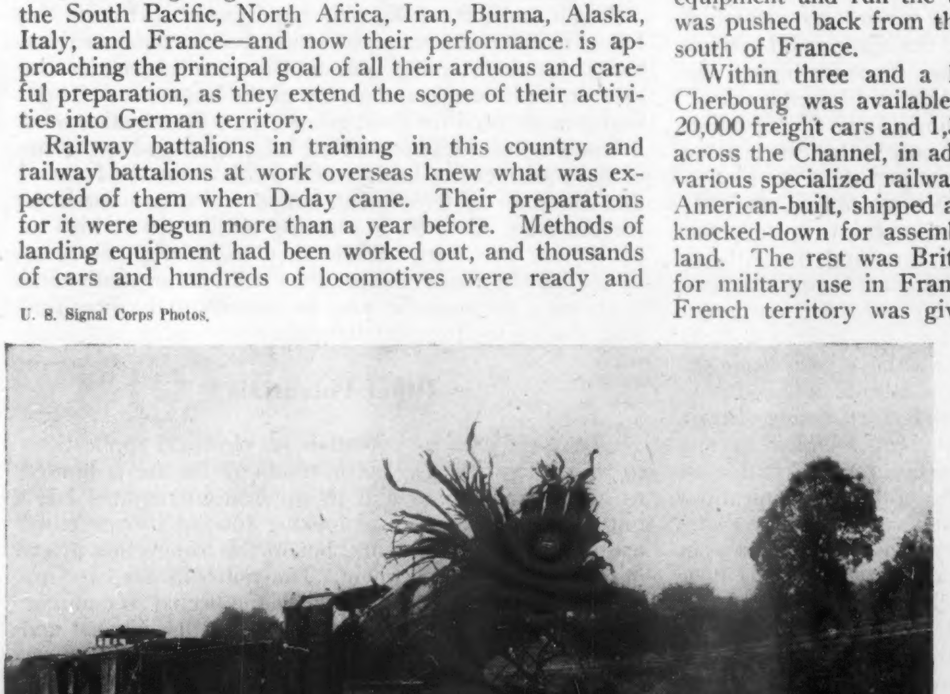
American railroad men in military service have gone with active fighting units into each theater of action—the South Pacific, North Africa, Iran, Burma, Alaska, Italy, and France—and now their performance is approaching the principal goal of all their arduous and careful preparation, as they extend the scope of their activities into German territory.

Railway battalions in training in this country and railway battalions at work overseas knew what was expected of them when D-day came. Their preparations for it were begun more than a year before. Methods of landing equipment had been worked out, and thousands of cars and hundreds of locomotives were ready and waiting in England to be ferried across the Channel to France as fast as the rails were cleared for them to operate. M. R. S. personnel was ready to move in the equipment and run the trains as quickly as the enemy was pushed back from the shores of Normandy and the south of France.

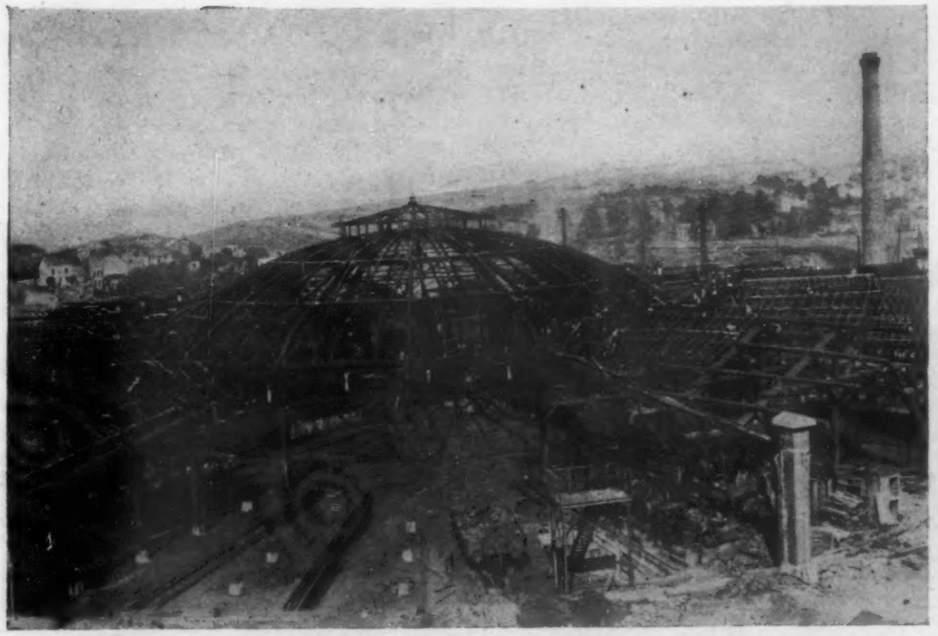
Within three and a half months after the port of Cherbourg was available to the United Nations, about 20,000 freight cars and 1,300 locomotives had been moved across the Channel, in addition to 37 hospital trains and various specialized railway equipment. Much of this was American-built, shipped across the Atlantic more or less knocked-down for assembly by M. R. S. units in England. The rest was British railway equipment adapted for military use in France. In addition, as rapidly as French territory was given up by the retreating Germans, additional rolling stock which they left behind became available for M. R. S. use. All property belonging to railroads taken over in whole or in part by M. R. S. personnel in France or other areas was being utilized to its capacity, and capacity was being measured in terms of war necessity and American operating methods, as far as they were applicable under the prevailing physical and military conditions.

Because operations in France following D-day at once assumed first importance in American land force activities, M. R. S. performance in that area has been

U. S. Signal Corps Photos.



The French Railroads' Pre-War Locomotive Supply Has Been Severely Depleted—American Bombers Wrecked This Train



Round House at Mohon, France, After U. S. Bombers Scored a Hit

signals and miscellaneous facilities in shape to resume train operations as quickly as the tracks were cleared.

in recent months, the most conspicuous aspect of its contribution to the general military effort. Army railroaders came ashore on the Normandy beaches hard on the heels of the invasion wave, and in the south of France they moved into liberated territory as rapidly as the way was cleared for them to go to work. The actual process of taking over the French railway lines, including removal or neutralization of mines and "booby traps" left behind by the enemy and rehabilitation of the running tracks, was primarily the responsibility of the Army engineers, but they frequently had the aid of M. R. S. personnel even in that phase of the job, not only with technical advice but with actual physical assistance. Moreover, while the engineers were doing their part, Army railroaders had to get rolling stock, shops, signals and miscellaneous facilities in shape to resume train operations as quickly as the tracks were cleared.

Beach Landings

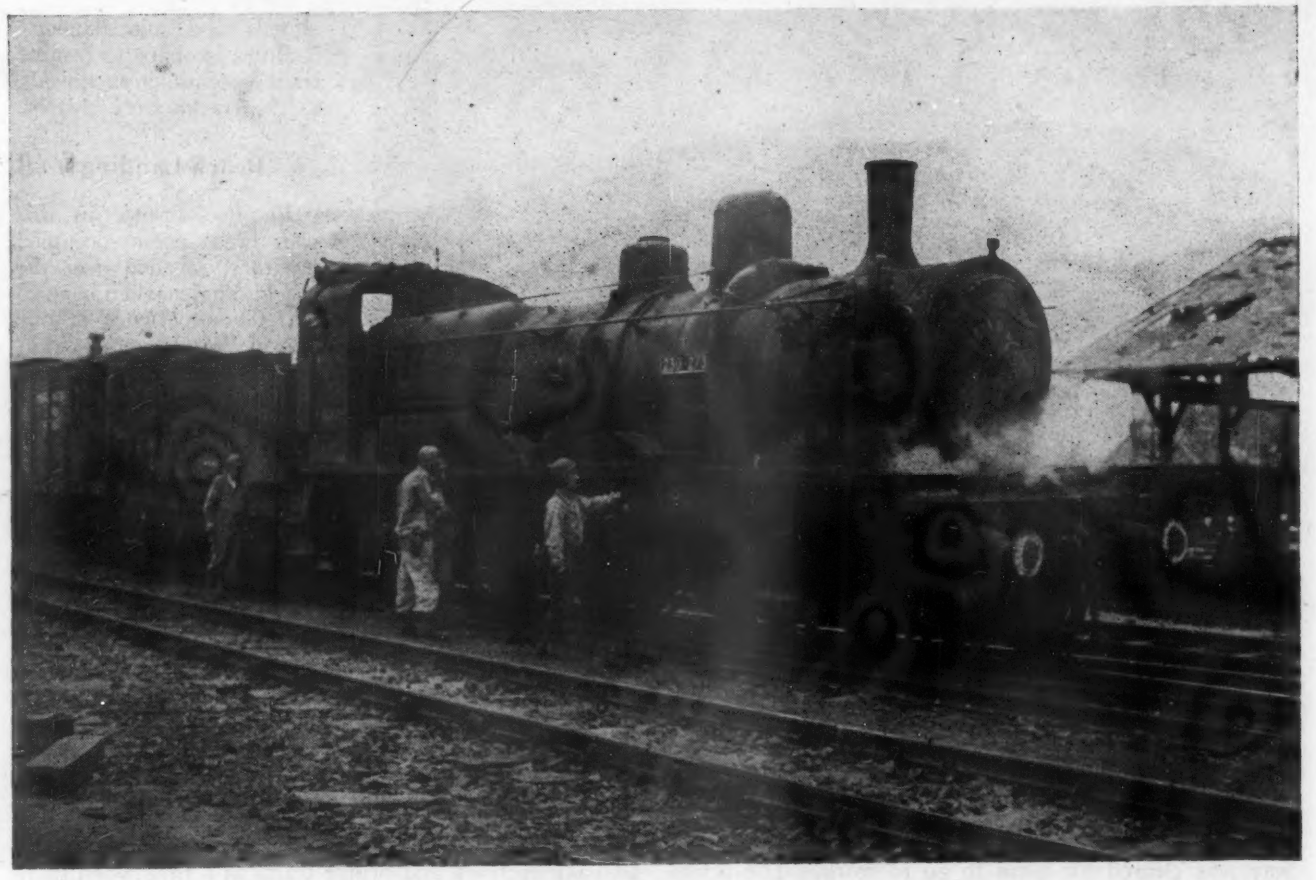
Because France in this war was enemy-occupied territory, invaded over the beaches and retaken in combat, the experience of our World War I overseas railway operating forces seldom provided precedents, particularly in the initial stages of operation, for the M. R. S. to follow in 1944. The first segment of French railway to fall into American hands in the invasion ran parallel to the Channel coast and toward the port of Cherbourg, then in enemy hands. In view of the usefulness of this line, not only in the movement of materials brought in over the beaches as the armies advanced inland but particularly when Cherbourg was captured and its port opened to United Nations' shipping, it was essential to restore it to service at the earliest possible moment. To do this effectively the engineers required equipment to make up track and bridge trains at a time when there was no port under American control where cars and engines could be unloaded.

To meet this situation, the United Nations' joint Channel ferrying committee came up with an idea (credited to Colonel Sidney H. Bingham, in peacetime the superintendent of New York's municipally-operated subways), subsequently used by both the British and American armies, for fitting LCT-4 type landing craft to carry a specially designed caterpillar tractor-caterpillar trailer combination which in turn carried a 150-hp. Diesel locomotive. Right after the invasion, these craft were brought into the beaches so the caterpillars could be run ashore. The Diesels were then unloaded and put to work, enabling the track and bridge reconstruction to proceed. Thus the line was ready to be used for the movement of food and munitions to the fighting troops when Cherbourg was taken and cars and locomotives could be put ashore there.

Ferrying Equipment

Plans had been developed well in advance to bring over regular railway equipment as soon as the boats

French Yards Blasted by the Allied Aerial Attacks



Overseas Version of the "Broadway Limited"

A French locomotive, reconditioned by a M. R. S. operating battalion, switching a hospital train—The crew (l. to r.) Harold L. Mills (Clinton, Ill.), Dale R. Davidson (Trenton, Mo.), Herbert C. Wilmert (Lincoln, Ill.), and Earl Sillimon (Willard, Ohio).

could get into Cherbourg harbor. The available train-ferry vessels were those that had been used in pre-war days to shuttle the London-Paris trains across the Channel. These boats were so few, and their capacity was so limited, that it was estimated that 3½ years would have been required to ferry over with them the rail equipment that would be needed to support the advance of the fighting front.

Faced with this limitation, the committee set up an arrangement by which the pre-war train ferries were assigned to the job of carrying locomotives, while a number of ships of the LST-2 type were converted to car ferries. Three parallel tracks, connected with switches, were laid on the flat lower deck of these tank carriers, giving each a capacity of 22 freight cars. The next problem was that of overcoming a 24-foot rise and fall of the tide on the French shore, which would have limited landing operations through fixed facilities to some 1½ hours at each high tide. This was met by constructing a long, jointed, wheeled bridge which rested on a railway track sloping into the water and which in turn carried a standard-gage railway track. This contraption was pushed in and pulled out by the action of the tide, maintaining a continuous connection with the permanent track through sleeves fitted over the head of each rail. An apron afforded a connection with the open mouth of the LST, enabling the vessel's load of cars to be run ashore without delay at any hour.

Steam-powered 0-6-0 switchers and 2-8-0 road locomotives formed the bulk of the train ferries' contribution to the trans-Channel movement. However, in addition to the 150-hp. Diesels brought in over the beaches, and others of this and larger sizes that were assigned to switching service, some 130 road Diesels of the 650-hp. type and 26 of the 380-hp. type were soon put ashore in France. The Diesels were particularly useful near the fighting lines, as the lack of smoke and steam plumes made them much less conspicuous targets than steam-powered units for enemy fliers and artillerists, while their ability to make long runs without stops for fuel and water was a further advantage in operating on lines where rehabilitation of such supplementary facilities had not been completed.

Bombing Played Havoc

Following the advancing armies across France from the Normandy peninsula, the M. R. S. was soon operating main-line French railroads. These had been less seriously damaged by the enemy, in general, than the recovered Italian lines, because he had fallen back too rapidly to do a thorough job of destruction. However, the effects of intensive American and British bombing on transportation facilities behind enemy lines were evident in the shattered bridges and devastated shop and yard facilities taken over by the M. R. S. as the advance proceeded. While many French locomotives and cars were recovered intact, as well as some German-built or other European cars brought in by the enemy and left behind in his retirement, the French railroads' pre-war supply of around 18,500 locomotives, 515,000 freight cars and 31,100 passenger cars had been severely depleted, both by enemy operations and by the success of the United Nations' bombers.

The principal French railroad lines radiate from Paris like spokes in a wheel, making the capital and the nearby Versailles focus a potential bottleneck for traffic moving

from Normandy to points near the German border, where the bulk of the fighting soon shifted. Nevertheless the Transportation Corps kept supplies moving up. The first trainload moved through Paris to the front on September 4, only about two months after the first train was run out of Cherbourg. Since that time, as Maj. Gen. Frank S. Ross, chief of transportation in the European theater, recently wrote, "The trend of daily tonnage has been steadily increased until it has now reached a stream of supplies which will meet the needs of the fighting men at the front. The vast volume of these supplies could be transported in no other way except by rail."

The 230-mile Cherbourg-Paris rail line soon became the main route for the movement of supplies to the front, though it was supplemented with a useful but more roundabout alternate route involving some secondary trackage. In addition, a French-operated line to Paris from ports in Brittany, further west than Cherbourg, was intensively employed, and other routes were set up by which supplies put ashore at Le Havre, Dieppe and other smaller ports were fed into the rail lines running north and east from Paris into Belgium, Luxembourg and Germany itself. The capture of Antwerp and the recent opening of that port afforded substantial relief to the M. R. S.-operated lines in France, as the Belgian railroads leading thence to the front are capable of moving heavy traffic and provide a much shorter connection between ocean shipping and battlefront depots.

Relief Through Antwerp

The Belgian lines are under joint British and American military control, and serve a substantial sector of the battle front, but they are most useful to the British armies concentrated at the northern end of the United Nations' line of advance. However, Antwerp's pre-war facilities, relatively undamaged and able to handle around 40,000 tons of freight daily, are relieving the burden on the French ports materially, and with its occupation came a definite end to the period when transportation capacity sometimes limited the quantity of supplies that could be delivered to the front to support the advance.

An indication of the intensive use made of the Channel ports is the record made at Cherbourg. Its pre-war normal freight volume was around 3,000 tons a month. Within less than six months after its capture, in a state of almost complete devastation, it was handling 20,000 tons or more a day, and supplies were going forward on the railroads to Paris in volume that required the operation of forty-one 400-ton freight trains daily. For a short time Diesel-powered trains were run through from Cherbourg to the front line supply bases, but it was found preferable to use these units, designed primarily for switching, in shorter runs near the front, using steam power for the faster long runs.

Another phase of Army railroading in France that required the most exacting consideration was the preparation and operation of trains for the sick and wounded. In addition to the trains brought over from Britain for this purpose, others were assembled from French equipment. Standard trains consisted of 16 to 20 cars which were specially fitted with adequate heating and electrical devices.

Altogether, the Army took over five main lines in France, as well as considerable secondary trackage. About 1,500 miles of railroad was rehabilitated, and large new yards were developed to take care of unprecedented traffic. In the initial stages of M. R. S. operations in France, before tracks had been rehabilitated and equipment brought in to meet immediate requirements, truck convoys were used to support the rail movement of materiel from the ports to the front. The so-called Red Ball truck circuit, which changed its base from time to time, was operated full-blast for months. Recently its importance has declined because more port and rail facilities have become available. Trucks endured terrific strain on this operation. Additional relief has come to the rail lines to offset the decline in highway freight movement, however, as alternate means of transportation have been restored by the French for the movement of essential civilian traffic, such as the substantial volume of coal normally shipped into Paris by water. For a time, until damaged canals and river facilities were repaired, the flow of military supplies was interfered with to some extent by such civilian traffic that could not be eliminated.

The Route from Marseilles

While much French equipment was lost or destroyed, enough was left for civilian operations to be resumed in considerable volume on lines in other parts of France, where military demands were negligible. Not all the M. R. S.-operated French rail lines are in northern France, however. One of the most important of all is the route from Marseille, the great Mediterranean port of France, up the Rhone valley to the area back of the southern end of the United Nations' line along the Rhine. This route, much of it consisting of two parallel lines on opposite banks of the Rhone, has been of increasing importance as its bridges and other damaged facilities

Army Railroaders Had to Get Rolling Stock, Shops and Facilities in Shape to Resume Train Operations Quickly

have been restored. Recently the shop facilities in southern France have been augmented by the transfer by sea of shop installations that were erected in England to set up the knocked-down equipment sent over from the United States in advance of the invasion

Left-Hand Operation

In order to make full use of the French signaling installations and station facilities, the plan to make right-hand operation on double-track lines standard practice for M. R. S. operations was changed, after a brief period of experiment, to the left-hand method prevailing in France. Where trains pass into areas using right-hand operation as standard practice, however, as in Germany, that method is used, as pre-war installations of cross-overs and other facilities were generally adapted to this procedure.

Not all the plans made in advance of D-day for railway operations in France came to fruition. A relatively

large quantity of railway engineering material still lies on the beaches of Normandy, where it was put ashore in preparation for the job of rebuilding the main French railways leading to Paris. Because of the unscheduled rapidity of the German withdrawal, the rehabilitation job was less extensive than had been expected, and more usable material was left behind by the enemy than was anticipated.

Later, as reconstruction work was carried on in eastern France and Belgium, it was easier on transportation to use material produced in the mills of France and Luxembourg than to move forward what had been left in Normandy, so it remains untouched and is likely to be left indefinitely.

The Situation in Italy

Military railroaders in northern France are directed by the officers of the 2nd M. R. S., under the command of Brig. Gen. Clarence L. Burpee. Units in the south of France are attached to the 1st M. R. S., which is under the command of Brig. Gen. Carl R. Gray, Jr., and which controls American military railway operations in the entire Mediterranean theater. This territory includes Italy, where a total of 2,478 miles of railroad had been repaired and operated by Allied M. R. S. units and Italian civilian rail employees by October 1, 1944. American, British and South African troops rebuilt some 1,100 miles of this. A summary of the situation in Italy as of last October has recently come to this country from General Gray, who reports that, during the five months then ended, 21,759 trains had carried over seven million tons of military freight to the United Nations' armies in that country.

In the same period 3,154 troop trains and 812 hospital trains were run. This traffic was handled largely with repaired Italian equipment, including 785 steam and electric locomotives and 28,127 cars which were rehabilitated by Allied troops. However, about 225 American-built locomotives and 200 freight cars were brought in to supplement the equipment taken over.

General Gray reported also that, since May 10, Allied railway troops, following the advance of the line of battle and often working within range of enemy artillery, have built over 15,000 ft. of new bridging, rebuilt 24 tunnels with a total length of 20 miles, and moved half a million cubic yards of earth to fill gaps in viaducts and craters left by explosions. Over 750 miles of signal lines have been restored. In addition, more than 70 miles of new railway line has been built.

Records in Iran

American railway operations in Iran are under the 3d M. R. S., commanded by Col. Frank S. Besson, Jr. Its headquarters is Teheran, where freight is turned over to the Russian-operated, or northern, segment of the Trans-Iranian railway. Far from the area of active fighting, this line continues to be important in the supply of American-made materiel to Russia, and it handles a steadily-increasing tonnage, though its operations are now characterized by its personnel as uniformly monotonous.

In the first ten months of 1944 this line handled over a million tons of freight. Supplementing oil-burning steam-powered locomotives of various types, the M. R. S. has introduced a number of American-built 1,000-hp. Diesel-powered road switchers. These engines are particularly useful in the desert and arid mountain sections where water is scarce, and have earned the name "iron camels" because of their fitness for such territory. Since the Iranian line has bridges of limited capacity and its rail is soft, by American standards, it was necessary to add an extra axle to the trucks of these 120-ton units before they could be operated successfully in that service.

Regular operating practice calls for 2,500-ton trains in the relatively level desert section of this line, using the Diesels, while 1,500-ton trains can be handled on the mountainous segment, using two engines. It is not unusual to double-head a Diesel and a steam locomotive, as the combination has been found to produce more speed than the former type alone and more pulling power than the latter. Speed is limited—theoretically—to 25 m.p.h., but trains occasionally get out of control on downgrades, as not more than one-fourth of the cars are fitted with air brakes and the engine is largely depended on for braking. Some difficulty in engine operation results from sudden temperature changes, since units leaving the 130-deg. heat of the desert have to pull capacity loads to the mountain summits, then idle on downgrades where winter temperatures frequently prevail. A detailed description of the Iranian railway appeared in *Railway Age* of July 22, 1944, page 152.

Another major M. R. S. operation is the meter-gage Bengal & Assam line in India and Burma, which is a main supply route not only to Allied troops in action in that area but also a part of the "over the hump" route into inner China. Accounts of this line's characteristics and prevailing operation methods appeared in *Railway Age* of April 14, 1944, page 739 (accompanied by a map), and June 24, page 1208. The railroad units in that theater are in charge of Brig. Gen. Paul F. Yount.

Battalion Organization

The training activities of the M. R. S. in the United States have been described in *Railway Age* from time to time in the past year, particularly in the issue of November 18, page 786. The operating organization developed before Pearl Harbor has proved itself in action, and is substantially uniform throughout M. R. S. installations. The basic unit is the operating battalion of four companies, developed to run as much railroad as would make up the jurisdiction of an ordinary American division superintendent. In addition to a headquarters company—which takes care of dispatching and supply problems—each operating battalion consists of a "C" company of two platoons of fifty five-man crews each, a maintenance-of-equipment or "B" company for the operation of engine terminals and car repair tracks, and a maintenance-of-way, or "A" company to keep up roadway signals and structures. Supplementing this basic unit is the shop battalion, organized to handle a medium-sized back shop where heavy and classified repairs can be made. In addition there are various miscellaneous units, such as base depot and transportation companies, mobile workshop detachments, and hospital train maintenance crews.

"Right Up There Close"

As 1944 ended, the M. R. S. was looking forward to the day when it would be called upon to operate railroads leading directly to Berlin. In the words of Brig. Gen. Andrew F .McIntyre, cheif of the Rail Division, Office of the Chief of Transportation, "No one is yet sure as to the requirements of the future, but whatever demands may be made upon the armies of the United States, you will find Military Railway Service troops right up there close behind the battle lines doing their parts."

CANADA'S *railways weigh future*

Continue their unsurpassed traffic output, wondering how aggressive popular gratitude will be when firing ceases

By RAILWAY AGE'S CORRESPONDENT AT OTTAWA

With some significant but not fundamental variations, the situation of the railways in the Dominion is remarkably parallel to that of the rail carriers south of the border.

Traffic is at an all-time high and the public recognizes the value of the railways' service—but shows the same reluctance as in U. S. to translate friendly sentiments into concrete action to afford carriers better prospects of a peacetime livelihood.

The railways make preparations for large improvements in post-war service, necessarily contingent on whether they are permitted to make any money or not.

Small chance is seen that the Dominion will move politically to the "right" as far as railways are concerned, in the next election.

DURING more than five years of war the Canadian railways have moved freight and passengers in quantity and numbers that seem incredible to those who were accustomed to the limitations of railway accommodation before the war. The railways in the same period have had to struggle along with a minimum of new equipment and a shortage of man-power which in itself has placed an additional strain on the available facilities and personnel.

Good Soldiers

There is no attempt on the part of the Canadian railways to do any boasting, because they know that the railway services in the United States, proportionately on a vastly larger scale, have been performed under similar stringent man-power conditions—but possibly not with such serious equipment handicaps. They have simply tried to do their duty as all other Canadians at home have done, and as the valiant men of the army, navy and air force have done against the enemy.

Because of the inability to employ more men, to buy more than the minimum of equipment and to meet more than the bare maintenance requirements—and also because of vastly increased revenues—the Canadian Pacific and Canadian National have been able greatly to improve their financial postion. Both roads have been retiring some maturing obligations and refinancing others at lower interest rates while, as a part of the government's

In Canada, As Elsewhere on the Continent, Passenger Terminals Are Thronged With Service Men—This Is Central Station, Montreal

All Photos Courtesy C.N.R.

27 of These Were Added to the C. N. R. Fleet in 1944

policy, most of the Canadian National securities held in Britain have been repatriated to place more Canadian dollars to the credit of Britain for war purchases in the Dominion.

How Effective Is Friendly Opinion?

In Canada, as doubtless also in the United States, what the railways would like to know is what kind of policy will be adopted toward them by the government when the fighting is finished—what recognition if any will the continuance of their services secure when competition by other agencies of transportation is restored to full vigor. Will the railways be able to get better pay for their freight and passenger services, and will they have a fair share of the more lucrative business? Or will they be tossed to the winds again, left with little more than the poor paying traffic and having to battle it out under inequitable handicaps with the trucks for the cream of the business?

Many times in Parliament at Ottawa a few legislators have raised their voices on behalf of post-war railway policy, but such voices have seldom risen to heroic pitch. They said fine things about what the railways have done and are doing in the war, but they just could not see that much could be done about establishing fair competitive conditions as between rail and highway transport. A prominent official said in Ottawa a few days ago that the railways would certainly have a good case for higher freight rates, particularly in view of the greatly increased wage bill, but, of course, the presentation of such a case would have to await the end of hostilities in Europe, at least, and by that time the truck operators will have a better supply of gasoline, tires and new vehicles in sight.

Another aspect of this post-war rail situation was presented by the same Ottawa official. He said that, while freely admitting the strength of the railway case for higher rates, he felt the railways themselves would with an easing in the man-power situation find it possible to increase their efficiency considerably by a thorough overhaul of their personnel. He thought that in a year or two both the Canadian Pacific and the Canadian National could make vast improvements in their service and in their net returns for their service by a policy of more rapid retirement, getting the older employees out of active service more quickly. But, obviously, this cannot be achieved until there is a larger reservoir of personnel to which to apply such a policy.

Higher Wages, Frozen Rates

The wage bill has proved a considerable financial problem for the railways in Canada. There was the living cost bonus which the railroad employees got many months ago—$4.60 a week—and then came the demand of both the transportation unions and the other classifications for a wage increase. The classes other than transportation asked, in the fall of 1943, for increases ranging from 23 to 42 cents an hour, the transportation unions asking for no specific increase, though they said the wage problem confronting them was the same as that of the other rail unions.

In 1944 the Dominion War Labor Board granted a

vast majority of rail employees—transportation employees and other classes—an increase of 6 cents an hour. Had the demand of the unions been fully met employees of the Canadian roads would have been placed on a basis similar to that of New England roads—but, actually, only 25 per cent of the demand was granted. It has been impossible to get any close estimate of the cost of the wage increases, but the aggregate increase in the wage bill to both roads will be about $30,000,000. And this higher wage bill has to be paid without any possibility of a compensating rise in rates. Rate increases seem to be regarded as bad business in war-time. As in other fields of private enterprise there is in Canada, in effect, a solid floor for wages and a low ceiling for freight and passenger rates, plenty of maximum in pay for workers and plenty of minimum in return for employers, an economic policy not peculiar to Canada and not confined to railroad services.

Political Activity Plentiful

Probably more in the Dominion than in the United States the railroad situation has been bedevilled by political activities. Most of it began in Western Canada. In the pioneer days the two historic parties—Liberal and Conservative—sought to outpromise each other to the farmers in abundance of railroad lines and what were in reality hopelessly uneconomic freight rates, and that condition prevailed up to the outbreak of this war. Such cases as the Crow's Nest Rates, the successful fight of prairie grain growers to get the same inexpensive railroad access to the Pacific ocean, over the Rockies, as to the head of the Great Lakes, and the tragic case of the Hudson Bay Railway.

This road was and always will be a white elephant, to use an exceedingly mild term, and the port facilities at Fort Churchill, which never approached profitable operation before the war, were not so long ago to be regarded as one of the important factors in allied victory but the extremely limited navigation season on that route, even with a large expenditure of Dominion money to provide every conceivable aid to navigation, can never make it an economic project. Then the Peace river railway project, which might be justified in the war because it tapped oil and grain areas, will after hostilities be in reality an uneconomic service, the cost, of course, being borne by the taxpayers. Branch lines were built all over the prairies, and many of them were useful, but in the past five or six years some of these have been abandoned.

C. T. C. on Moncton-Halifax Line

Political Outlook Not Encouraging

Political prospects are not bright for the railways. Radical groups are likely to have much to say about legislation at Ottawa for a considerable time to come. Present indications are that in the next Dominion general elections the Liberal party will come back with the largest group, though not with a clear majority, and it will probably be necessary to count on the support of some other group with similar leanings, and the most likely group would be the Socialists, labeled now as the C. C. F. party (Co-Operative Commonwealth Federation). The probability of such a coalition makes it easy to predict the probable predominant policies on taxation and toward wages for labor.

It will also have a direct bearing on the much debated Air Transport Board established by legislation last summer and the provision in it for the divorce of the air lines from the railroads. Munitions Minister C. D. Howe insisted that for post-war commercial aviation development it would be inadvisable to permit the two railways to continue to operate air lines. He said, in reply to criticism in the House of Commons, that he was not trying to shackle the Canadian Pacific or trying to strangle the Canadian Pacific Air Lines by insisting on the two being separated, but the fact remains that, while the C. P. R. must by one year after the war in Europe divest itself of any financial interest in its air system, the Trans-Canada Air Lines (which have grown up under the aegis of the Canadian National) will still be a government enterprise competing against the C. P. R., and allowed the use of tools which are denied to the privately owned railway.

Both T. C. A. and C. N. R. can still lean on the national purse for capital outlay, if this be needed, and both also have a considerable leverage from their relation to the national government. This is not to ignore the fact that the Canadian National is efficiently managed, that it is not run largely, if not completely, as is a private enterprise. Nevertheless, there is a psychological factor in the fact of its public ownership. There is, however, at this time no chance of a reversal in Dominion air policy. If the Liberals continue in power, they will pursue the plans announced by Mr. Howe; and this situation would not be improved should the Socialists gain more say-so about national policy than they now enjoy.

President Vaughan Surveys the Year

In his year-end review, President R. C. Vaughan, of the Canadian National, said in part:

"It is estimated that 82,000,000 tons of revenue freight were handled in 1944, as compared with 80,427,000 tons in 1943, an increase of 2 per cent. The number of passengers carried in 1944 was 36,000,000, as compared with 34,501,000, an increase of 4 per cent. Gross revenues for 1944 will be on a level with

1943. Operating revenues have been estimated at $440,000,000, with operating expenses $362,000,000, leaving a net operating revenue of $78,000,000.

"Although, with heavy increased expense, due to wage increases and a rise in the cost of materials, the net revenue is not as great as it was in 1943, the system is still in a position to turn over a cash surplus to the Dominion treasury, after the payment of interest due to the public and the government.

"The cost of living bonus and increases in basic wage rates, following Dominion War Labor Board awards since the beginning of the war, including the award of last August granting still further increases, some of which were made retroactive, adds approximately $40,000,000 to our payroll as compared with 1939. In addition, materials have cost us over $20,000,000 more in 1944 as compared with 1939 prices. Realizing that serious economic repercussions might result, no application has been made for increases in freight rates or passenger fares.

More Motive Power

"Twenty-seven new steam locomotives and ten Diesel switchers were delivered to the company during the year, and 4,762 box cars and 1,500 freight cars of other types were received. The company's property, including track and roadbed, and buildings, were well maintained. All the summer hotels remained closed but were protected against deterioration due to vacancy. The eight other hotels wholly operated by the company continued to maintain their traditional high standards, though demands for service were great and difficulties due to shortage of labor and materials not few. It might be interesting to mention here the importance of the function of the dining car department. With fewer cars available than in pre-war years, six times as many meals were served on the diners in 1944.

"The Canadian National Telegraphs transmitted 8,752,000 revenue land line messages and 518,000 revenue cables during the year, many thousands of which were for members of the armed forces at home and overseas.

"Communication between the men and women overseas and their families at home has been greatly accelerated by the trans-Atlantic service operated by our associate company, Trans-Canada Air Lines, the four-engined Lancasters making three return flights weekly between Montreal and Scotland.

"Rounding out a quarter of a century of service between Canada, and Bermuda, the British West Indies, British Guiana and British Honduras, the Canadian National Steamships continues to be an important factor in the war. It was assigned specific West Indian zones and was entrusted with the operation, in many parts of the world, of ships taken over or seized by the Canadian government. Its freighters ply the Seven Seas in the service of the United Nations. One of the West Indies liners, the Lady Nelson, is now Canada's senior hospital ship. Another, the Lady Rodney, is an army transport. Two ships formerly in the Alaska service, the Prince Henry and the Prince David, are doing duty

Train Communication Test by C. N. R. Vice-President Walton

A New Iron Mine in Ontario Sends Out Its First Ore

as combined operations cruisers, and the Prince Robert is an anti-aircraft cruiser. All three were given important tasks in the invasion of Europe.

"The Prince Rupert Dry Dock & Shipyard, a subsidiary of the Canadian National, carried on its program effectively during the year. To date, it has constructed four minesweepers and eleven ten-thousand-ton freighters. Since the outbreak of war, the 20,000-ton floating dry dock has handled 815 ships and repairs have been effected on 2,280 floating craft of all sizes.

"National Railways Munitions Limited, a subsidiary, and the company's own shops have continued the manufacture of naval gun barrels, field artillery carriages and naval mountings.

Research for Further Progress

"The first concern of the Canadian National system in all its ramifications is the winning of the war. At the same time, we are giving close attention to the problems of reconstruction and re-establishment. Research has been made and plans prepared for our post-war program and the railway is actively co-operating with industry in working out a blueprint for peace. It is too early to go into details, but I might mention, as an example, that we have in mind new types of passenger equipment. The trend after the war will be toward what we call 'closed accommodation' in sleeping cars, to such types as roomettes and double bedrooms. Hundreds of thousands of travelers have, through the war, learned, for the first time, the comfort and convenience of travel by night, and we shall be prepared to meet their requirements. We plan new types of coaches and improved dining facilities for travelers. Taking into account the expansion of the smoking habit, we have in mind enlarged facilities for smokers. The railways are alive to the fact that competition with other forms of transport will be accentuated after the war and they may be depended on to keep abreast of the times and provide the service that will insure them their fair share of the traffic."

Prospects as Mr. Coleman Sees Them

President D. C. Coleman of the Canadian Pacific in his year-end statement made, among others, the following observations:

"The year 1944, now about to close, has been one of generally sustained activity for the railways of this country. We do not know what the coming year will bring us. There is the earnest hope, and even the high expectation, that well before it has passed the war in Europe definitely will be over. I do not believe that the period of re-adjustment which will follow need necessarily be marked by such a pronounced industrial and commercial depression as that which occurred after the last great war. It should be remembered, that this war will have lasted consider-

ably longer than did that of 1914-18 and that the necessity for war production has been far greater and has seriously affected a far wider range of our peace-time industries, with the result that these industries in their effort to catch up with the normal need for non-war products will have before them a task that will take some time to accomplish. These factors should work for a more gradual return to normal conditions, lengthening the period of transition and broadening the possibility of maintaining the ratio of a high percentage of employment.

"The part which Canadian railways will have to play in this work of re-adjustment will be no less important or exacting than that which they have so successfully achieved during the war. They will enter upon the task as greatly in need of new equipment and improved and increased facilities as will any other industry, and the necessity for a wise planning of their future development will be no less important or exacting. This planning not only will envisage the transportation requirements that are to fall upon their shoulders but will also take into consideration the fact that they necessarily must accept their share of responsibility for the maintenance of as high an average of national employment as is possible under such circumstances as will arise.

Seeking Improved Methods

"For some time now the Canadian Pacific Railway has had a special committee of its officers at work formulating plans for this re-establishment and reconstruction period and its deliberations have covered a wide range of activities. Already it is apparent that much will require to be done if the property and its equipment is to maintain through this period the high standard of efficiency which has marked its operation in the past.

"The outbreak of the war came at what appeared to be the final phase of a period of pronounced depression throughout which railway earnings had drastically reduced as the natural result of declining traffic. Notwithstanding this serious factor, the Canadian Pacific went into its war activities in first-class operating shape and reasonably well equipped to carry the war-time load. As this load increased to unprecedented proportions it was necessary to add to motive power and rolling stock as far as was possible. This, to some extent, was done under the handicap of scarcity of material, equipment, supplies and labor and steadily advancing costs of all of these. The result has been that a great deal of replacement of equipment as well as work of a development or improvement nature on the line itself has had to be deferred to after-war days when conditions were likely to be more nearly normal.

"Surveys and preparations for this work have been going forward for some time and the materials involved will include practically everything that enters into the construction and operation of a railroad. The types and standards of these materials will be most modern and the highest obtainable at the time. Activities under study include, among other things, large scale special maintenance projects and improvements on tracks and bridges in anticipation of increasing public requirements and increasing capacity and weight of locomotives; some new line construction to serve areas now settled and not served by railway, and improvements in shops, engine houses, freight sheds, passenger stations and other plants.

"It is to be expected that the company's shipping activities on both the Atlantic and Pacific oceans will at a reasonably early date assume at least the proportions of pre-war days. The program of work which I have outlined represents the expenditure of large sums of money. It falls into two classes, one having the nature of special maintenance of the property, while the other may be classed as betterments and extensions. It is the company's expectation that the costs of these projects can be met out of reserves for such purposes, earnings and, where necessary, judicious financing.

"The successful meeting of the above expenditures is, of course, predicated on the expectation that economic conditions, costs of materials and labor and regulatory controls of what the company may charge for its services will be rendered sufficiently flexible to allow the company such modest profits from which to meet them as it enjoyed previous to the depression of the nineteen-thirties."

C. P. R. Earnings

Gross earnings of the Canadian Pacific for 1944 have been estimated at $321,000,000 and a guess of net earnings is $43,000,000, a decrease of nearly 13 per cent under the actual net for 1943. Estimated C. P. R. freight train-miles for 1944 are 35,000,000, an increase of about 7 per cent over the actual of 1943, and passenger train-miles 20,500,000, an increase of about 3 per cent over the actual for 1943.

Thirty steam locomotives of the new 1200 class designed for a major role in post-war power replacement will be delivered to the Canadian Pacific Railway in 1945 from Montreal Locomotive Works. Delivery of the entire order will bring to 219 the number of new locomotives added by the C. P. R. since the start of the war. Included in this total are 13 Diesel-electric switching locomotives ordered earlier from American Locomotive Company at Schenectady, N. Y., for 1945 delivery.

The Issue Between the "Left" and the "Right"

"Money is a right or title to demand something from others." . . . "Money" in one's possession is the same as a *credit* on the community's stocks of goods and services against which one can draw at will. The *credit* arises from a previous *contribution* to the community's stocks of goods and services for which no equivalent in kind has been demanded or received by the creditor, or by some previous creditor or creditors who transmitted it to the present holder. . . .

There are not a few earnest moralists who inveigh against "money" in terms which seem to imply that it is an "evil" thing *per se* and that it has corrupted the modern life beyond repair. Logically, this would be equivalent to branding "property" as an evil thing but they do not state it in those terms. What they seem to have in mind is the "machinery" by which "money" is circulated through the economic body—banking, "finance," foreign exchange, currency and so forth—as largely a means of taking money from its rightful owners or preventing those who have rightly earned it from receiving and owning it. This is merely the fallacy of confusing use and abuse. . . .

But there is more confusion about "money" than this; there is the debate over "capitalism"—the "capitalist system." There is a school of opinion which views the system as an evil thing in itself, just as our moralist extremists seem to view money. Yet "capital" is nothing but money (or property) and the capitalistic system is nothing but the use of "money" for purposes of producing things other than goods and services for immediate consumption or enjoyment. If it be not morally wrong to use "property" for such purposes—and no one seems to assert this in definite terms—what is morally wrong with the capitalist system as such? . . .

The real debate between "left" and "right"—the real conflict—is over who is to exercise the "power" to govern the "system" and who is to receive the "money" that results from its operation. Merely that. And another fact is that jealousy over another's share of the product seems to be as strong a source of conflict as desire for a larger share for oneself—sometimes stronger! We attempt sometimes to cover it up by assuming that these "inequalities" must be the result of chicanery somewhere, that they cannot represent "value received" by the community. . . .

This is not to be understood as suggesting that we have yet attained a condition in which justice can be said generally to reign. We are far from it. It is merely to suggest that even had we attained it there would in all probability be the same "right-left" conflict powered by the same emotions.

—Thomas F. Woodlock in the Wall Street Journal

MEXICAN *railways set new records*

Largest traffic and gross earnings in history plus increased rates fail to improve net—Costs of labor and materials show rapid increase

BY OUR CORRESPONDENT IN MEXICO

THE extensive reorganization and rehabilitation program of the National Railways of Mexico, which was started in 1941, was continued throughout the past year. The improvements made under this plan enabled the railroad to carry successfully the largest volume of traffic it has ever handled. Numerous changes in the executive staff have been made, including the appointment of a new board of directors. The board now consists of seven members; one each from the departments of communications, finance and labor, representing the federal government; one from the Confederation of Chambers of Commerce; one representative of industry; and two from the Mexican Union of Railroad Workers. The board has only advisory functions, the general manager of the railroad reporting directly to the president of the Republic.

During the year Margarito Ramirez resigned as general manager and was replaced by Andres Ortiz. Upon the death of J. J. Franco, Antonio E. Vera was appointed assistant manager in charge of operations, being replaced by Jesus P. Belaunzaran. Pedro C. Morales was recalled as general superintendent of motive power, as was Eugenio Rodriguez y Parra as chief engineer. Other appointments named Manuel Buen Abad, assistant manager in charge of accounting and finance; Manuel S. Mayagoitia, assistant manager in charge of labor and personnel; Tomas Valles, general treasurer, and Louis Couttolenc, general purchasing agent.

Work of the Railway Mission

The United States Railway Mission in Mexico, working under a co-operative agreement between the governments of the two countries, continued its studies to improve transportation, maintenance of way, mechanical, accounting and purchasing practices. The mission was under the direction of Oliver M. Stevens until his resignation effective September 1, 1944. Elliot V. Vandercook was appointed chief of the mission to succeed Mr. Stevens.

Upon the recommendation of the mission, considerable rehabilitation work has been done, especially on the lines between Laredo and Mexico City and between Cordoba and Suchiate. Besides the physical rehabilitation program now under way, a vast educational plan is being established. It is expected that this training program, which combines the best features of both the correspondence schools and oral instruction, will enable promotions to be made on the basis of knowledge as well as seniority alone. The new plan was placed in operation January 1, 1945.

Sixteen new 660 and 1,000 hp. switch Diesels were purchased during the latter part of the year. Seven of these are working in the yards at Monterrey and eight are assigned to the Nonoalco yards in Mexico City.

Loaded Cars Interchanged, January to October

	Imports		*Exports*	
	1944	1943	1944	1943
Laredo	20,168	15,784	14,016	19,831
El Paso	3,267	3,909	8,639	7,423
Eagle Pass	4,163	2,805	2,021	3,707
Brownsville	1,167	1,213	3,306	2,747
	28,765	23,711	27,982	33,708

The total number of loaded cars imported to Mexico through border gateways of Nuevo Laredo, Tams., Giudad Juarez, Chih., Piedras Negras, Coah., and Matamoros, Tams., during the first ten months from January to October, 1944, were 28,765 cars as compared with 23,711 in the same period of 1943, an increase of 5,054 cars.

Whereas total exports through the same gateways decreased from 33,708 in 1943, to 27,982 in 1944, war materials exported through these gateways increased from 16,998 carloads in the first ten months of 1943, to 18,212 in 1944. The National Lines were unable to increase war material exports further because they had to assign a large number of locomotives to the movement of Mexican labor to work in the agricultural fields and on railroad tracks in the United States.

Total revenue freight traffic handled on the National Lines during the first six months of 1944 was 6,074,319 tons as against 5,541,644 in 1943, an increase of 9.61 per cent, the highest in the history of the lines. Following is a breakdown of the traffic:

	First six months	
Commodity	1944 tons	1943 tons
Forest products	649,169	400,425
Agricultural products	1,808,895	1,600,908
Animals and animal products	144,967	162,008
Inorganic products	2,749,366	2,690,767
General merchandise	721,922	687,536
	6,074,319	5,541,644

The increased volume of revenue traffic produced the highest total earnings in the history of the National Lines.

The National Railways of Mexico handled 6,074,319 tons of freight during the first six months of 1944, for an all-time high mark. Financial results for the first nine months show gross earnings of 220,589,592 pesos for record earnings. All operating indices except average speed and gross ton-kilometers per train-hour showed significant improvements. In spite of these favorable results, net earnings declined during the first nine months from 17,048,422 pesos in 1943 to 15,338,068 pesos in 1944. Improved methods of accounting set up in May, 1944, plus increases in wage rates and material prices were the primary causes for the failure of net income to show an increase comparable to the increase in gross earnings. The railways enter 1945 with prospects of still larger total eornings due to a 20 per cent increase in freight rates, effective January 1; and enlarged operating expenses because of a 30,000,000 peso increase in wages granted during the latter part of 1944.

Gross earnings increased from 183,939,268 pesos in the first nine months of 1943 to 220,589,592 pesos in the same period of 1944, an increase of 36,650,324 pesos, or 19.93 per cent. Of this, freight revenues increased from 123,145,380 pesos to 134,132,066 pesos; passenger receipts from 33,981,586 pesos to 53,626,958 pesos; express earnings from 17,403,064 pesos to 21,347,472 pesos; baggage earnings from 97,304 pesos to 118,101 pesos; telegraph earnings from 25,595 pesos to 30,698 pesos, and miscellaneous earnings from 5,793,450 pesos to 7,404,391 pesos. Other than operating income, such as car rental, etc., increased from 3,492,888 pesos to 3,929,906 pesos.

Operating expenses increased from 166,890,847 pesos in 1943 to 205,251,524 pesos in 1944, or 22.99 per cent due partly to higher salaries and higher prices of imported and Mexican materials, but principally due to the fact that the depreciation and deferred maintenance accounts were set up in May, 1944.

The maintenance of way department increased expenses from 26,293,250 pesos in the first nine months of 1943, to 39,694,463 pesos, or 50.97 per cent; maintenance of equipment from 50,210,076 pesos to 61,097,547 pesos, or 21.68 per cent; transportation from 58,399,685 pesos to 66,978,269 pesos, or 14.69 per cent; express from 6,599,055 pesos to 8,433,682 pesos, or 27.80 per cent; general expenses from 10,222,955 pesos to 11,579,431 pesos, or 13.27 per cent; traffic from 1,425,430 pesos to 1,753,150 pesos, or 22.99 per cent; miscellaneous, from 737,414 pesos to 966,474 pesos, or 31.06 per cent; other than operating expenses from 13,011,468 pesos to 14,748,508 pesos, or 13.35 per cent. There was a credit of 8,488 pesos in 1943 for the transportation of additions and betterments materials, and none in 1944. As a consequence of the higher ratio in the increase in expenses than earnings, net earnings were reduced from 17,048,422 pesos in the first nine months of 1943 to 15,338,068 pesos in the same period of 1944.

Operating Statistics

The president of Mexico, using the emergency powers invested in him, signed a decree authorizing a 20 per cent increase in freight rates for the national Lines to be in force during 1945, barring minerals, ore concentrates and metals, which will improve the earnings still further and offset the high labor and material expenses.

Selected Operating Statistics

First ten months 1944-1943

	1944	1943	Inc. or Dec.	% Change
Freight train-kms.	13,858,988	14,559,321	700,333	4.8
Passenger train-kms.	7,712,200	8,738,099	1,025,899	11.7
Mixed and spec. train-kms.	3,805,371	3,167,787	637,584	20.1
Non-revenue train-kms.	319,886	172,650	147,236	85.3
Total train-kms.	25,696,445	26,637,857	941,412	3.5
Passenger car kms.	76,654,576	73,767,379	2,887,197	3.9
Frt. loaded car kms.	221,083,842	228,123,121	7,039,279	3.1
Frt. empty cars kms.	87,531,074	92,679,044	5,147,970	5.6
Total frt. car kms.	308,614,916	320,802,165	12,287,249	3.8
Net ton-kms. (1000s)	6,657,878	6,416,459	241,419	3.8
Gross ton-kms. (1000s)	14,227,663	14,115,852	111,811	0.8
Total No. cars loaded	414,090	424,999	10,909	2.6
Averages				
Net ton-kms. per train-km.	446	421	25	5.9
Gross ton-kms. per train-km.	903	884	19	2.1
Speed per hr. (kms.) Ft.	18.2	20.1	1.9	9.5
Gross ton-kms. per train hr.	16,463	17,793	1,330	1.1
Frt. loc. kms. daily	167	178	11	6.2
Liters oil per 1000 GTK-frt.	47.5	43.2	4.3	10.0
% loaded car-kms. to total	71.6	71.1	0.5	0.7
Net tons per car	30.1	28.1	2.0	3.3
Kms. line operated	11,740	11,757	17	0.1

More Traffic Than Ever Before Is Rolling Over Mexico's Railway Bridges

During the first ten months of 1944, gross ton-kilometers handled reached the peak of 14,227,663,000, as against 14,115,852,000 in the same period of 1943, an increase of 0.8 per cent. Net ton-kilometers, however, increased in a higher ratio, from 6,416,459,000 to 6,657,878,000, or 3.8 per cent indicative of better car loading, which increased from 28.1 to 30.1 tons per car. The increased net tonnage was handled with fewer train-kilometers, which decreased from 14,559,321 to 13,858,988. Net ton-kilometers per train-kilometer increased from 421 to 446, or 5.9 per cent. The increase in gross ton-kilometers per train-kilometer, from 884 to 903, reflects a better utilization of tractive power. Road and terminal delays to freight trains caused freight train speed to decline from 20.1 to 18.2 kilometers per hour. The slower train movement resulted in a decrease in gross ton-kilometers per train-hour from 17,793 to 16,463 in spite of the increase in gross ton-kilometers per train-kilometer.

Labor Relations Continue to Improve

The employees of the National Railways of Mexico were given an increase of 45 pesos per month per man in the latter part of 1944, representing a total increase of 30,000,000 pesos per year. President Avila Camacho issued a decree on March 8, 1944, authorizing the general manager of the National Railways to make whatever changes were necessary in the collective labor contracts, in order to re-establish discipline and improve railroad transportation in the country, and notwithstanding the drastic changes made there was no antagonism between the management and the syndicate, relations having been extremely cordial. However, some trouble was experienced because of sit-down strikes by some of the crafts, especially train and enginemen, and boilermakers, who decided to withdraw from the syndicate and form their own brotherhood of engine and trainmen, and union of boilermakers. Drastic action by the government put an end to such disputes.

Higher wages made higher costs in repairing rolling stock, but lack of materials brought repair expenditures down. During the twelve months ending August, 1944, labor costs for repairs to passenger cars, per 1,000 kilometers run, were 33.12 pesos as compared with 28.99 pesos in the twelve months ending August, 1943, or 14.20 per cent, and material costs decreased from 20.69 pesos to 20.20 pesos, a decrease of 2.4 per cent. Repairs to freight equipment per 1,000 kilometers run increased from 27.33 pesos to 30.38 pesos for labor, or 11.2 per cent, and materials decreased from 30.64 pesos to 27.30 pesos, or 10.9 per cent.

1944 railway OPERATIONS

Freight and passenger traffic, gross revenues and wages broke all records, but increased payrolls, material costs and taxes caused a decrease in net

By DR. JULIUS H. PARMELEE

Director, Bureau of Railway Economics

RAILROADS of the United States underwent in 1944 the severest performance test of all time. They adequately and satisfactorily met the record-breaking demand for transportation service. In doing so, they again demonstrated their vital character as an arm of the military establishment, and made a highly important contribution to the welfare of the American people, both in respect to furtherance of the war effort, and in the satisfaction of civilian needs and requirements.

As will be shown in later sections of this review, railways of Class I in the United States, in 1944:

1. Handled 740 billion ton-miles of freight traffic, breaking all previous records.
2. Handled 96 billion passenger-miles, a record high.
3. Collected a gross revenue of 9½ billion dollars, an all time peak, but showed a decrease in net earnings as compared with the two prior years.
4. Whereas gross revenues in 1944 showed an increase of two billion dollars over 1942, net railway operating income declined by one-third of a billion dollars, and net income decreased by one-quarter of a billion dollars.
5. Employment, in 1944, was greater than in any year since 1930. Wage rates and the aggregate railroad payroll were the highest in history.
6. Manpower and material situations, in 1944, were still tight.
7. The 78th Congress enacted certain legislation directly affecting railroad interests, but failed to pass such important legislation as the Land Grant Bill.
8. Four large railway companies emerged from the hands of the courts during the year.
9. Railways continued to effect a reduction in their funded debt and fixed charges.

Transportation and the American people as a whole suffered a serious loss in the death, in March, of Joseph B. Eastman, a member for more than 25 years of the Interstate Commerce Commission, and at the time of his death Director of the Office of Defense Transportation. His selfless devotion to public service had brought him an influential place in government councils, where his assistance in meeting the many problems of the future will be sorely missed.

Table I—Comparative Traffic Statistics

REVENUE CARLOADINGS (thousands

1944	43,500	1939	33,911
1943	42,440	1933	29,220
1942	42,826	1929	52,828
1941	42,290	1923	49,812
1940	36,358	1918	44,592

REVENUE TON-MILES (millions)

1944	740,000	1939	333,438
1943	727,075	1933	249,223
1942	637,,983	1929	447,322
1941	475,072	1923	412,727
1940	373,253	1918	405,379

REVENUE PASSENGER-MILES (millions)

1944	96,000	1939	22,651
1943	87,820	1933	16,341
1942	53,659	1929	31,074
1941	29,350	1923	37,957
1940	23,762	1920	46,849
		1918	42,677

Traffic and Revenue Trends

The statistics for 1944 presented in this and later sections are preliminary, and are subject to such later revisions as may be necessary when actual and final returns for the year have become available.

Revenue carloadings, ton-miles, and passenger-miles for 1944, 1943, and certain earlier years, are shown on a comparative basis in Table I.

Revenue Carloadings. Total carloadings in 1944 aggregated 43,500,000 cars, an increase of more than one million loads over 1943, or 2.5 per cent. Loadings of carload traffic showed an increase of 1.8 per cent, while loadings of LCL traffic increased 7.5 per cent.

Table II distributes the carloadings of 1944 among the eight general commodity groups, and shows the increase or decrease (D) in 1944 over or under the corresponding totals for 1943.

Table II—1944 Carloadings by Commodity Groups

(thousands)

	1944	Increase over 1943 Number	Per cent
Miscellaneous	20,010	439	2.2
Coal	8,920	413	4.9
Merchandise, l.c.l.	5,460	380	7.5
Ore	2,660	D 156	D 5.5
Grain and grain products	2,520	D 128	D 4.8
Forest products	2,280	51	2.3
Live Stock	900	62	7.4
Coke	750	D 1	D 0.1
Total	43,500	1,060	2.5

Revenue Ton-miles. Revenue ton-miles of freight approximated 740 billion in 1944, an increase over 1943 of 1.8 per cent.

Chart A compares the record volume of railroad ton-miles in 1944 with each of the preceding five years, and with 1929 and 1918. The previous peacetime peak in freight traffic was experienced in 1929. The year 1918 was, of course, the peak traffic year of the first World War.

Ton-miles handled in 1944 were one and two-thirds times the number of ton-miles handled in 1929, one and five-sixths times that of 1918, and considerably more than twice as great as in 1939.

However, the volume of freight traffic in 1944, which showed increases in each month through June, turned downward for the balance of the year. Table III shows the number of revenue ton-miles handled during each month of 1944, compared with the corresponding month of 1943.

Table III—Revenue Ton-miles, by Months

(millions)

Month	1944	1943	1944 Per cent Increase
January	60,488	55,135	9.7
February	59,307	54,418	9.0
March	62,670	61,231	2.4
April	60,289	59,036	2.1
May	64,270	62,150	3.4
June	61,715	57,965	6.5
July	62,540	63,739	D 1.9
August	64,460	65,100	D 1.0
September	61,182	62,543	D 2.2
October	*63,500	65,226	D 2.6
November	*59,400	59,861	D 0.8
December	.....	60,615	..

*Estimated.

The monthly trend in ton-miles is shown by Chart B. July, 1944, was the first month to show a decrease in ton-miles (compared with the corresponding month of the next preceding year) since October, 1940.

The freight traffic pattern was not the same in 1944 on all railroads. For example, ton-miles handled by all railways showed an increase of 2.9 per cent for the first nine months of 1944 as compared with the corresponding period of 1943. Railways in the Eastern District, however, showed an increase of only six-tenths of one per cent and railways of the Southern Region an increase of only one-half of one per cent. Railways of the Western District, however, reported an increase of 6.4 per cent. In the month of September, ton-miles in Eastern District showed a decrease of 6.3 per cent, in Southern Region a decrease of 2.9 per cent, and in Western District an increase of 2.6 per cent. The overall result, as shown in Table III, was a decrease of 2.2 per cent.

Revenue Passenger-miles. Revenue passenger traffic reached another high record in 1944, amounting to 96 billion passenger-miles, 9.3 per cent above the passenger volume of 1943.

Chart C shows the number of revenue passenger-miles handled in 1944, compared with each of the preceding five years, and with 1920 and 1918. Passenger traffic attained its previous peacetime peak in 1920.

Passenger-miles, as in the case of ton-miles, showed a tendency to level off during the second half of 1944. Chart D portrays the monthly trend from January, 1943, to the latest available date. August, 1944, was the first month to show a decrease in passenger-miles since July, 1940.

War Traffic. As an indication of the transportation service rendered by the railroads in the war effort, they handled for the Army alone, during first three years from Pearl Harbor to the end of 1944, a total of 28,000,000 men in organized troop movements and 225 million tons of freight and express. During the year 1940 the railroads unloaded at all American ports for export a total of 818,000 carloads. This increased in 1941, 1942, and 1943, to a total of 1,462,000 carloads in 1943. In the first 11 months of 1944, the total was 1,745,000 carloads, or more than for the whole year 1943.

Employment and Wages

Average employment in the railroad industry in 1944 increased by 4.4 per cent over 1943, compared with an increase of 6.6 per cent in 1943, over 1942. The average number of workers during the year 1944 was 1,414,200, compared with 1,355,114 in 1943. These figures are shown in Table IV.

Table IV—Average Number of Employees

Group	1944	1943	Per Cent Increase
Executives, officials, etc.	14,500	13,998	3.6
Profession, clerical, etc.	229,000	218,956	4.6
Maintenance of way	295,500	274,104	7.7
Maintenance of equipment	389,400	372,619	4.5
Transportation:			
Other than train, engine, and yard	167,300	160,182	4.4
Yardmasters, switch tenders, hostlers	18,000	17,131	5.1
Train and engine	300,500	298,124	0.8
Total	1,414,200	1,355,114	4.4

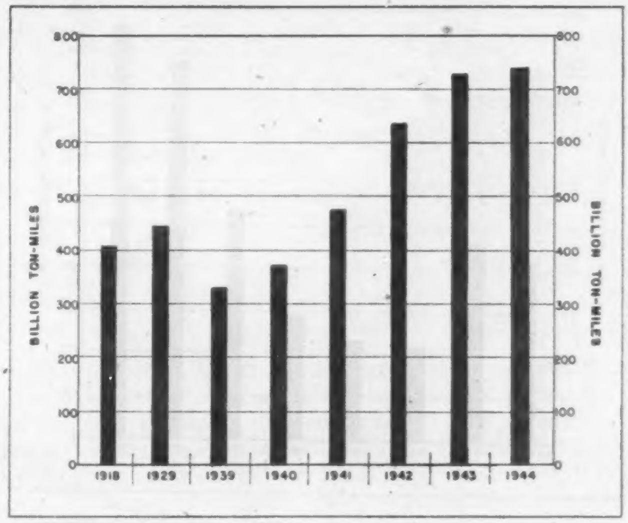


Chart A—Revenue Ton-Miles of Freight, Class I Railways

Increased employment was reflected in all of the principal groups of employees. The maintenance of way group showed the greatest numerical increase of any group, as well as the greatest percentage increase.

Employment increased in 1944, as it did in 1943, but the demand for rail workers continued to exceed the supply. Thus the manpower problem in the railroad industry remained still unsolved, despite earnest efforts toward improvement, by the various war agencies involved, by the Railroad Retirement Board, the railroad industry through its manpower committees, and individual railroad companies and their personnel departments. An indication of the extent of the problem is the need for 90,153 workers near the end of the year, which is shown by certain general groups of occupations in Table V.

Table V—Personnel Needs

Group	Nov. 1 1944
Executives, professional men, telegraphers and clerks	3,861
Trainmen and enginemen	7,643
Skilled trades journeymen	13,924
Skilled trades helpers and apprentices	14,185
Laborers	48,361
Attendants, cooks, porters and waiters	1,405
Miscellaneous	774
Total	90,153

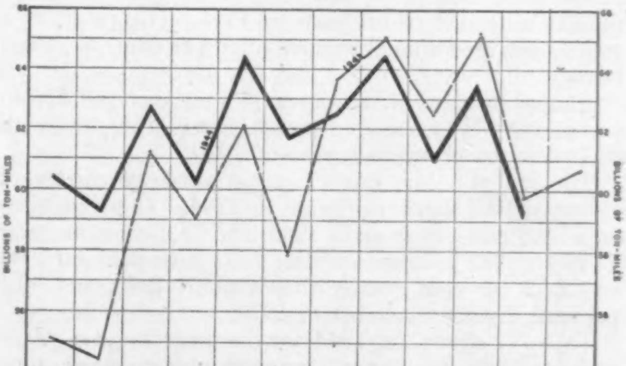


Chart B—Revenue Ton-Miles by Months, Class I Railways

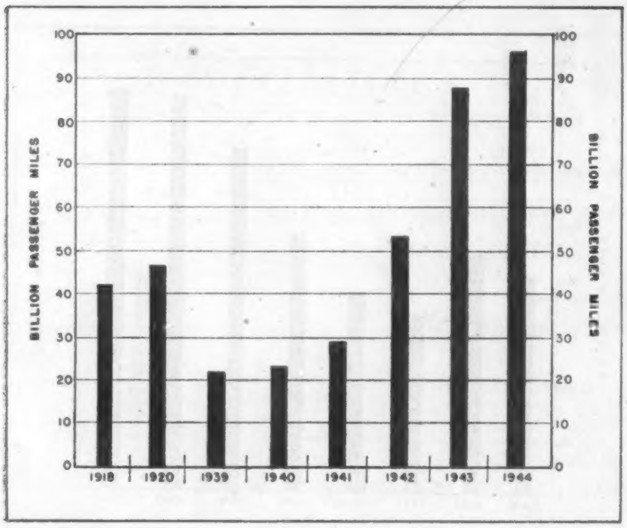


Chart C—Revenue Passenger-Miles, Class I Railways

Following the trend which has continued since the beginning of the war, laborers constitute the largest number of needed personnel, 48,361, or 53.6 per cent of the total. Skilled trades journeymen and helpers account for 31.2 per cent of the total. Critical needs developed at various points for switchmen, brakemen, firemen, mechanics, and other key occupations.

During the year the tight labor situation was slightly relaxed by an increase of imported workers from Mexico. Approximately 35,000 of these workers are now employed by 31 rail carriers, and a maximum of 50,000 such workers has been authorized.

Employment of women on the railroads continued to increase during the year, the total now being in excess of 116,000, or about 8.5 per cent of their total personnel. This compares with a figure of about 106,000 at the end of 1943.

Class I railroads have supplied close to 300,000 men and women to augment the nation's fighting and other military forces.

Wages. The total railway payroll for 1944 approximated $3,875,000,000, an increase of $354,000,000, or about 10 per cent over 1943. The aggregate payroll for 1944 was the largest in railroad history. It was $193,000,000 greater than the payroll of 1920, when railway employment exceeded two million men. Railway employment in 1944 was, however, only 1,414,000. The fact that two-thirds as many employees in 1944 as in 1920 drew down $193,000,000 more in pay emphasizes the increased rates of pay granted to railroad workers between those two dates, and the increased work opportunities extended to the men in 1944. The result is a greatly enlarged annual compensation per man, as shown below.

Annual earnings of railway employees averaged $2,740 per man in 1944, compared with $2,598 in 1943, and with $1,744 in the prosperous year of 1929.

The straight time rate of pay of railway employees averaged 92.2 cents per hour in 1944. This compares with 89.3 cents an hour in 1943, and 74.2 cents an hour in 1940. The average straight time rate paid in 1944 was 24.3 per cent greater than that of 1940, and 40.1 per cent greater than that of 1929.

Table VI shows, for 1944, for the preceding five years, and for 1929, the average number of employees, total payroll, average annual compensation of employees, and average straight time rate of pay.

Table VI—Employees and Compensation

Year	Average number	Total payroll (millions)	Compensation per employee per year	Aver. hourly straight time rate (cents)
1944	1,414,200	$3,875	$2,740	92.2
1943	1,355,114	3,521	2,598	89.3
1942	1,270,687	2,932	2,307	83.5
1941	1,139,925	2,332	2,045	76.9
1940	1,026,848	1,964	1,913	74.2
1939	987,675	1,863	1,887	74.0
1929	1,660,850	2,897	1,744	65.8

As detailed in our *Review of Railway Operations in 1943,* the railways at the close of 1943 had before them a wage dispute as a result of which the Army, by executive order, took possession and control of railroad transportation facilities in order to avert a nation-wide railroad strike. That occurred on December 27, 1943, and continued for a period of 22 days, until midnight of January 18, 1944, after the final agreement in settlement of the wage dispute had been approved by the Economic Stabilization Director.

The wage dispute culminated in the following wage increases:

For nonoperating employees, an increase in wages during the period February 1, 1943, to December 26, 1943, of amounts ranging from 4 to 10 cents per hour, and effective December 27, 1943, an additional increase by amounts ranging from 5 cents down to one cent per hour. The total of both increases averaged 9.4 cents.

For the operating groups of employees, an increase of 4 cents per hour effective from April 1, 1943, to December 26, 1943, and effective December 27, 1943, an additional increase of 5 cents per hour, a total increase of 9 cents.

The supplemental increases which were made effective December 27, 1943, were in lieu of claims for time and a half pay for time worked in excess of 40 hours per week, and for expenses away from home terminal in the case of operating employees.

In addition to the foregoing wage increases, the operating group of employees was granted a vacation allowance of one week a year with pay. The nonoperating group had previously been granted vacations with pay effective January 1, 1942, as the result of a decision of an Emergency Board and subsequent mediation in late 1941. The vacation grant to nonoperating employees applied to those occupations not already enjoying equal or better vacation provisions.

At the end of 1944 the railroads were faced with demands from the nonoperating group of employees for a considerable liberalization of the vacation arrangement. That group of employees is now requesting a paid annual vacation of 12 days after one year of service, 15 days after two years of service, and 18 days after three years of service.

The retroactive portion of the final wage settlement is reflected in the earnings of the employees shown for 1943 in Table VI. Earnings for the year 1944 reflect the full effect of that settlement.

Railway Equipment and Material Situation

The railroads experienced some easing of the material situation in 1944, as compared with the restricted fulfillment of the 1943 program, although 1944 deliveries still remained somewhat less than requests.

Table VII—New Equipment and Rail

	Locomotives (number)	Freight Cars (number)	Steel Rail (net tons)
1945—Program	660	50,000	2,900,000
1944—Program	1,200	50,000	2,600,000
Deliveries	1,011	34,432	1,900,000
1943—Program	878	80,000	2,100,000
Deliveries	620	27,360	1,500,000
1942—Program	974	113,594	1,632,000
Deliveries	783	80,874	1,280,000

Railroad programs for new equipment and for new rail, together with actual deliveries are shown in Table VII. Data relating to equipment are for the 12 months ended September 30, while the rail data are for the calendar year.

Near the end of the year, the War Production Board announced that it may be possible to obtain, for the use of domestic transportation agencies, a greater allotment of materials for the first quarter of 1945 than had been anticipated.

Table VIII shows the number of units of equipment installed by railways of Class I during the first eleven months of 1944, and during each of the five years 1939 to 1943. The table also shows the number of units on order as of the close of each period.

Table VIII—Equipment Installations

	Installed During Year	On Order (December 31)
Steam Locomotives		
1944 (11 mos.)	305	90 (Nov. 30)
1943	429	339
1942	308	355
1941	161	258
1940	126	115
1939	100	51
Electrical and Diesel		
1944 (11 mos.)	541	405 (Nov. 30)
1943	344	616
1942	404	533
1941	472	288
1940	293	91
1939	220	66
Freight Carrying Cars		
1944 (11 mos.)	35,972	28,910 (Nov. 30)
1943	28,708	35,737
1942	63,009	27,061
1941	80,502	74,897
1940	65,545	35,702
1939	24,528	37,099

Locomotives. The number of locomotives in railroad service on October 1, 1944, was 194 smaller than on October 1, 1939, but 1,078 greater than on October 1, 1942. The number of serviceable locomotives, however, increased by 5,713 units between October 1, 1939, and October 1, 1944, and by 1,254 units during the last twelve months.

Table IX shows the locomotive situation as of October 1, 1939, 1942, and 1944.

Table IX—Locomotives in Service

	October 1 1939	October 1 1942	October 1 1944
Total railroad owned or leased	42,778	41,506	42,584
Number in or awaiting shop for classified repairs	8,177	2,446	2,270
Per cent	19.1	5.9	5.3
Number serviceable	34,601	39,060	40,314
Number stored serviceable	1,952	705	875
Number in active service	32,649	38,355	39,439

Table X—Freight Car Ownership

	October 1 1939	October 1 1942	October 1 1944
Total railroad ownership	1,643,898	1,736,588	1,757,897
Number undergoing or awaiting repairs	194,890	46,018	51,499
Per cent	11.9	2.6	2.9
Number serviceable	1,449,008	1,690,570	1,706,398
Number surplus	64,299	39,067	8,444
Number in active service	1,384,709	1,651,503	1,697,954

Freight cars. Table X shows railroad freight car ownership on October 1, 1939, 1942, and 1944. The net increase in ownership for the five-year period was 113,999 cars, or 6.9 per cent. The number of serviceable freight cars increased by 257,390, or 17.8 per cent.

A freight car shortage was reported for every week of the year 1944, but only in certain of the spring and fall weeks was the car supply tight. The annual grain movement continued to be the greatest single box car distribution problem. The heavy box-car demand for loading military supplies added to the problem of distribution.

Passenger Cars. The number of passenger-carrying cars owned by Class I railroads and the Pullman Company—not including dining, lounge, baggage, mail and express units—is shown in Table XI for 1939, 1942, and 1944, by major classes.

Table XI—Passenger Carrying Cars
(Including Pullman)

	December 31 1939	October 1 1942	October 1 1944
Coach and coach combination	20,825	20,570	20,596
Parlor cars	900	632	455
Sleeping cars	6,362	6,920	8,175
Total	28,087	28,122	29,226

Except for 1,200 troop sleepers, no new passenger cars have been constructed during the war period. It is possible, however, that construction and delivery of some new passenger equipment may be authorized in 1945. Orders for approximately 1,000 new passenger train cars, exclusive of Pullman cars, await authorization and release of materials.

Material and Supply Costs

An index of unit prices paid by railways for material and supplies is computed semi-annually by the Bureau of Railway Economics. Table XII shows the trend in the index since June, 1939, calculated separately for fuel, for other material and supplies, and for all material.

Table XII—Railway Material Prices
(May, 1933 = 100)

	Material and Supplies (Other than fuel)	Fuel (Coal and oil)	All Material
June, 1939	125.3	135.4	128.6
December, 1939	130.7	134.3	131.9
June, 1940	129.0	134.9	130.8
December, 1940	133.7	135.1	134.1
June, 1941	137.8	143.6	139.6
December, 1941	146.4	148.4	147.0
June, 1942	151.8	152.6	152.0
December, 1942	153.1	155.2	153.8
June, 1943	157.5	176.6	163.6
December, 1943	159.5	180.5	166.2
June, 1944	162.5	184.0	169.3

The increased cost of all railway material and supplies over the five-year period from June, 1939, to June, 1944, was 31.6 per cent. Fuel prices increased 35.9 per cent and the unit cost of material other than fuel increased 29.7 per cent. The corresponding increase over the twelve months from June, 1943, to June, 1944, were 3.5 per cent for all material, 4.2 per cent for fuel, and 3.2 per cent for other material.

Legislation

The second session of the 78th Congress convened on January 10, 1944, and continued with a number of recess periods until December 19. Congress considered several measures of major importance to railroads, but failed to take final action on any of them. Some general legislation was enacted, of interest to railroad companies as to other corporations. Several laws were passed which affected other types of transportation. Congressional attention continued to focus principally on wartime measures.

Tax Bill (*Public Law 235*). This measure became a law on February 25 after Congress had overridden a Presidential veto. One of the increases in excise taxes imposed by the new law increased from 10 to 15 per cent the tax on the amount paid for passenger transportation. This became effective April 1.

Reduced Fares for Armed Services (*Public Law 436*). This legislation, amending section 22 of the Interstate Commerce Act, authorized common carriers to grant

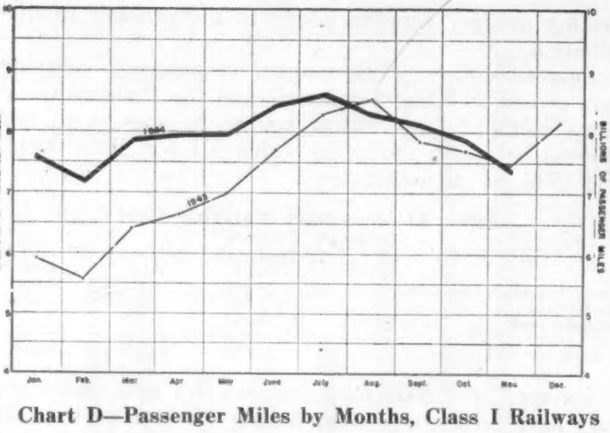


Chart D—Passenger Miles by Months, Class I Railways

reduced fares to personnel of armed services when traveling at their own expense. Approved September 27, 1944.

Postwar Highway Bill (*Public Law 521*). This measure provides authority for a $3,173,250,000 postwar highway program in which the Federal government would spend $1,673,250,000 and the States $1,500,000,000, over a three-year period. The major part of the Federal expenditures—$500,000,000 for each of the three post-war years—would be matched on a 50-50 basis by the states. In addition to the matching program, the measure authorizes $173,250,000 in Federal funds for park, forest and Indian reservation roads for the three years. Congressional appropriations must follow to make the program effective. The law provides that not in excess of 10 per cent of the amount allocated for highways, or not more than $50,000,000 annually, may be expended for elimination of railway-highway crossings, and that the railroads will not be required to pay in excess of 10 per cent of the cost of construction of such projects. The act, which becomes effective after the President proclaims that the present emergency has passed, was approved on December 20.

Wartime Measures. During the latter part of the year, Congress enacted several measures extending certain wartime powers and providing the necessary legal background for converting the activities of the country to a peacetime basis when progress of the war makes such a change advisable. Included in this legislation was the Stabilization Extension Act of 1944 (Public 383), approved June 30, which amended and extended to June 30, 1945, the life of the Economy Price Control Act of 1942, and the Stabilization Act of October 2, 1942. This act contains a provision (Sec. 202) dealing with settlement of disputes between carriers and employees subject to the Railway Labor Act, and providing that disputes settled in accordance with the Railway Labor Act, when certified that they conform with the stabilization program, may be put into effect.

Other acts established a three-man Surplus Property Board to aid reconversion from a war to a peace economy through the distribution of government surplus property; provided a national program for war mobilization and reconversion; extended the War Powers Act for another year; and increased the debt limit of the United States from $210 billion to $260 billion.

Legislation Considered But Not Acted Upon

Omnibus Rivers and Harbors Bill (H.R. 3961). This bill, introduced in the House on January 13, 1944, originally included the St. Lawrence project, Beaver and Mahoning canalization project, Tennessee-Tombigbee River project, and the Alabama-Coosa project. Both House and Senate eliminated the St. Lawrence, Beaver and Mahoning, and Tennessee-Tombigbee projects, but left the Alabama-Coosa as introduced. The bill passed the House on March 22, and the Senate on December 12. Inasmuch as the Senate approved amendments covering many projects of a local nature, the bill on December 15 was sent to conference, and Congress adjourned without action.

Boren Land Grant Bill (H.R. 4184). This measure, which would eliminate land grant rates, was passed by the House on May 23, 1944, by a vote of 236 to 16. Hearings were held in June and August before a subcommittee of the Senate Committee on Intrastate Commerce. This committee reported the bill, with an amendment, on November 28, but the Senate adjourned before taking action.

Railroad Social Insurance Bill. This proposed legislation would replace the present Railroad Retirement Act and the present Railroad Unemployment Insurance Act with a new and much broader scheme of social insurance. A bill to that end (H.R. 4805) was introduced in the House by Representative Crosser of Ohio on May 15, 1944, while a companion bill (S. 1911) was introduced in the Senate on May 11 by Senators Wagner of New York and Wheeler of Montana. Representative Crosser on December 16 introduced a new bill (H.R. 5625), which is much shorter than H.R. 4805, and would amend the Railroad Retirement and the Unemployment Insurance Acts along lines similar to those of H.R. 4805. The pending measures propose, among other things, to add to the present retirement and pension systems a new system of life insurance annuities for survivors of railroad employees and employees retired on pensions. It also proposes to engraft upon the present unemployment insurance system, now confined entirely to occupational unemployment, a new feature of insurance against non-occupational sickness and accident. These two changes represent fundamental departures from the present systems. The railroads are now subject to payroll taxes of 6¼ per cent for the support of the existing retirement and unemployment systems. The pending bills, if enacted, would impose ultimate tax rates on the railroads of 9¼ per cent. The House held hearings on H.R. 4805 in May, at which time only proponents of the bill testified. On the Senate side, a subcommittee of the Committee on Interstate Commerce was appointed to consider the matter, but no hearings were held.

Minimum Wage Level (S. Con. Res. 48). This resolution, introduced by Senator Pepper of Florida, provides that it is the sense of Congress "that a straight-time hourly rate of 65 cents per hour is the minimum below which the National War Labor Board shall consider any wage rate substandard." Hearings were held in November before a subcommittee of the Senate Education and Labor Committee.

Court and Commission Action

Railroad Anti-trust Suit. On August 23, the Department of Justice filed a complaint in the United States District Court at Lincoln, Nebraska, against the Association of American Railroads and certain of its officers, the Western Association of Railway Executives, 47 western railroads and their chief executives, J. P. Morgan & Co., Kuhn, Loeb & Company, and some 31 individuals. The complaint charges violations of the Sherman Anti-trust Act and is directed chiefly against certain rate-making practices.

Supreme Court Review of Arizona Train Limit Law. The United States Supreme Court, on May 1, agreed to

review the case of Southern Pacific Company vs. State of Arizona, which involves the constitutionality of the Arizona Train Limit Law. The case is on appeal from the Supreme Court of Arizona, which upheld the validity of the statute and in so doing reversed the trial court.

Ex Parte 148 Intrastate Passenger Fare Cases. The validity of an Interstate Commerce Commission order requiring interstate railroads to increase their intrastate passenger fares to the level of interstate fares, as established by the Commission in its Ex Parte 148 proceedings, will be passed on by the Supreme Court of the United States as a result of its grant of review, on November 13, of district court decisions uphloding the Commission in cases docketed as North Carolina vs. United States, and Alabama vs. United States. The North Carolina case involves intrastate fares within that state alone, while the Alabama case covers intrastate fares in Alabama, Tennessee, and Kentucky.

Pullman Anti-trust Suit. A final judgment by a three-judge Federal District Court at Philadelphia on May 8 ordered Pullman, Inc., to separate the sleeping car business, operated by the Pullman Company, from the manufacturing business conducted by the Pullman-Standard Car Manufacturing Company. The decree required Pullman, Inc., to file with the court its election as to what disposition it would make of its interests, together with a plan to effectuate such separation. On September 30, Pullman, Inc., filed its election to dispose of all its interest in the sleeping car business, and submitted a plan offering to sell and dispose of the sleeping car proportion to a proposed new railway-owned company.

Competitive Bidding on Railroad Securities. The Interstate Commerce Commission in a report issued May 10 in Ex Parte 158, in the matter of competitive bidding in the sale of securities, found that railroad securities (with certain exceptions) should be sold through competitive bidding or its equivalent in order to obtain Commission approval. The Commission found further that for the present no formal rule or regulation in regard to the matter should be promulgated but said that railroads applying after June 30, 1944, for authority to issue securities under the provision of Section 20a would be expected to observe the Commission's findings.

Georgia Case. A case of considerable importance to railroads in the South, and in some degree to all rail carriers, was scheduled for argument before the United States Supreme Court on January 2, 1945. It involves a petition filed by the State of Georgia asking the Court to accept original jurisdiction over a suit that Georgia proposes to bring against 20 railroads, charging conspiracy in fixing rates alleged to be unfair to Georgia and its citizens. The case is somewhat unusual, because the Supreme Court rarely accepts original jurisdiction in cases before action is taken by a lower court. In addition, the Court's decision may have a bearing on the general railroad anti-trust suit noted above.

Army Operations

The Secretary of War took possession and control of the railroads on December 27, 1943, under Executive Order 9412. This action resulted from threatened strikes of railroad employees growing out of the wage dispute of 1943.

Executive Order 9412 directed the Secretary of War to assure continuous and uninterrupted transportation service and provided that he should "permit the management of carriers taken under this order to continue their respective managerial functions to the maximum degree possible."

At the time of signing the order, the President said:

> "Railroad strikes by three Brotherhoods have been ordered for next Thursday. I cannot wait until the last moment to take action to see that the supplies to our fighting men are not interrupted. I am accordingly obliged to take over at once temporary possession and control of the railroads to ensure their continued operation. The Government will expect every railroad man to continue at his post of duty. The major military offensives now planned must not be delayed by the interruption of vital transportation facilities. If any employees of the railroads now strike, they will be striking against the government of the United States."

The Secretary of War designated Lt. Gen. Brehon B. Somervell, Commanding General of the Army Service Forces, to act for him in carrying out the provisions of the Executive Order. General Somervell placed direct responsibility in the hands of Major Gen. Charles P. Gross, Chief of Transportation of the Army Service Forces.

Operating Regions

The railways were divided into seven operating regions, and a railway executive, commissioned with the rank of Colonel, was designated as in charge of each regional group. Those designated were Colonels Frederick E. Williamson, R. B. White, William J. Jenks, Ernest E. Norris, Ralph Budd, Charles E. Denney and L. W. Baldwin.

Martin W. Clement, President of the Pennsylvania Railroad was appointed adviser to Generals Somervell and Gross. J. J. Pelley, C. H. Buford, and W. C. Kendall, of the Association of American Railroads were designated expert consultants. A. F. Whitney and Alvanley Johnston, presidents of the Brotherhoods of Railroad Trainmen and Locomotive Engineers, respectively, were named labor consultants.

Before signing the Executive Order, the President, acting as arbitrator in the wage dispute involving members of the Brotherhood of Locomotive Trainmen and the Brotherhood of Locomotive Engineers approved the increase of 4 cents per hour which had been recommended by an Emergency Board effective from April 1, 1943, and granted a further increase of 5 cents per hour, effective December 27, 1943, in lieu of claims for time and one-half for overtime in excess of 40 hours a week and for expenses while away from home. These employees were also granted a paid vacation of one week per year.

On January 14, 1944, the carriers signed a similar agreement with the other three operating unions, the Brotherhood of Locomotive Firemen and Enginemen, the Order of Railway Conductors, and the Switchmen's Union of North America.

On January 17 the carriers signed an agreement with the non-operating group of employees, ratifying the 10 cent to 4 cent increase effective retroactively to February 1, 1943, to be replaced by a 11 cent to 9 cent scale effective December 27, 1943, the increase in scale to be paid in lieu of time and one-half pay for time worked in excess of 40 hours per week.

Following approval of this wage agreement by the Economic Stabilization Director on January 18, the President informed the Secretary of War that "All unsolved wage questions have been agreed upon," and the Secretary of War relinquished possession and operation of the railroads on January 18. The order of the Secretary of War stated:

> "In view of the short period of operation by the government under said Executive Order, all rights which the United States may have to an accounting with respect to the operation of the

carriers during the period of government possession, operation and control are hereby waived and released * * *"

The right to such an accounting was reserved as to any carriers should they fail on their part to execute a release.

The brief period of Army control, therefore, involved no financial considerations.

Office of Defense Transportation

The Office of Defense Transportation in 1944 concluded its third year of service as a war agency devoted to securing maximum ultilization of the nation's domestic transportation facilities for the successful prosecution of the war. The fact that during the year an all-time peak load of traffic was moved efficiently and with little or no delay testified to the efficacy of ODT efforts.

Because of the death of Director Joseph B. Eastman and March 15, Brigadier General C. D. Young, retired, was appointed acting director the following day. Col. J. Monroe Johnson, a member of the Interstate Commerce Commission was appointed Director on April 4, and General Young returned to his former post of Deputy Director.

The activities of ODT during the current period were directed largely toward making more effective a program of action which had been developed during the two preceding years. In some instances, previously established practices were tailored to meet changed conditions. In general, however, ODT action was concerned with attainment of the following objectives: (1) Conservation of existing transportation equipment; (2) greater utilization of transport facilities; (3) discouragement of unnecessary travel. Steps were taken, also, to relieve the manpower shortage of the railroads. In an effort to cut down passenger traffic, a series of "Don't Travel" appeals were made, including those pertaining to holiday trips and travel to conventions, athletic events, summer camps, southern winter resorts, and the like. Government travel was likewise curtailed.

Several minor changes occurred in the functions exercised by the ODT. To prevent traffic congestion, the ODT on January 5 broadened its control over export, coastwise, and intercoastal freight held at port areas and established, in addition, a control over important freight held in such areas. This change was made effective through General Order ODT 12A.

The rationing of new trucks and other commercial motor vehicles was turned over to the ODT, effective July 1. Rationing procedure was set forth in General Order ODT 44 and Administrative Order ODT 27. A major change provided for filing applications through the 142 district ODT offices throughout the country, instead of the 80 offices maintained by the Bureau of Motor Carriers of the I. C. C. On October 12 certain gasoline rationing functions formerly handled by ODT were turned over to the Office of Price Administration. Under the new procedure, applications by commercial motor vehicle operators for temporary and nonrecurring rations are made to OPA local boards rather than to ODT district offices.

The ODT on March 10 announced plans for a campaign to fill 100,000 job vacancies on the railroads. The manpower drive was conducted by a Railroad Manpower Mobilization Committee, composed of representatives of War Manpower Commission, ODT, Railroad Retirement Board, Association of American Railroads, railroad labor organizations, and Office of War Information. Effective March 12 the ODT ordered the Central Railroad of New Jersey to discontinue 68 of its suburban commuter trains in the Greater New York area, and to adjust other train schedules. This action was taken to provide train and engine crews to handle the record amount of war freight offered that road.

In accordance with an executive order issued by the President the ODT on August 12 took possession and started operating 103 strike-bound midwest trucking firms. The companies affected operate in Minnesota, North and South Dakota, Nebraska, Iowa, Kansas, Missouri, and in parts of Wisconsin and Oklahoma. The ODT was still in control of most of these carriers at the end of the year, although, for various reasons, ten or more of the companies involved have been released from government operation.

There was completed in October an extensive tow boat and barge building program previously initiated by the ODT. The program included 21 towboats and 155 steel barges, 100 for carrying oil, and 55 for transporting dry cargo.

Efforts were continued to conserve passenger train facilities for essential travel, especially the movement of military traffic. Joint action by the ODT and Interstate Commerce Commission, effective June 27, gave transportation priorities to disabled military, naval, and merchant marine personnel. ODT certificate of Preference and Priority No. 3 and ICC Order No. 213 provide in part that the railroads, when necessary, shall divert transportation facilities or cancel or discontinue passenger train service, and shall refuse permission for passengers other than invalid troops and their attendants to board passenger trains. On July 6, the ODT tightened its restrictions on wartime Government use of special trains, special cars, and extra sections, through issuance of an amendment to ODT order No. 24, which restricts the use of such equipment to transportation of members of the armed forces, prisoners of war, and Government-recruited workers. General Permit ODT 24-11, effective December 1, 1944, to January 15, 1945, authorized the railroads to operate special trains or extra sections during that six-week period when necessary to meet demands for carrying members of the armed services. Similar ODT permits were issued in 1942 and in 1943.

Railroads received approval from the ODT and the War Production Board for construction during 1944 of projects costing a total of $130,000,000.

Board of Investigation and Research

The Board of Investigation and Research, which was created as a temporary agency by the Transportation Act of 1940, terminated its work and disbanded on September 18, 1944. It transmitted to the President and Congress a number of reports, including summaries of its major studies and its recommendations. The reports included the Board's final report on relative economy and fitness, public aids, carrier taxation, Federal regulatory restrictions upon motor and water carriers, interstate trade barriers affecting motor vehicle transportation, railroad consolidation and employee welfare, the national traffic pattern, carload traffic study, 1939, the economics of coal traffic flow, economics of steel transportation, comparison of rail, motor, and water carriers, technological trends in transportation (including postwar capital requirements of the carriers), and practices and procedures of governmental control of transportation.

The several reports, because of the board's lack of finances at the time of its termination, have not been printed.

The board as originally set up consisted of Nelson Lee Smith, of New Hampshire, chairman; Robert E. Webb, of Kentucky, vice chairman; and C. E. Childe, of Nebraska. Mr. Smith resigned October 25, 1943, to become a member of the Federal Power Commission. Mr. Webb then became chairman, and continued in that capacity during the remaining tenure of the board.

Railroad Retirement Board Operations

Railroad Retirement. The retirement rolls of the Railroad Retirement Board as of September 30, 1944, included 165,511 beneficaries. Compared with 161,774 beneficiaries as of September 30, 1943, this represents a net increase of 3,737 persons. Annuitants (as distinguished from pensioners, or persons transferred from previous carrier pension rolls) increased by 7,076 persons, while deaths of pensioners accounted for a net decline of 3,339 in that category.

The total number of beneficiaries has changed only moderately during the past three years, as shown in the following tabulation.

As of September 30	1944 over 1943	1943 over 1942	1942 over 1941
Increase in annuitants	7,076	6,976	6,619
Decrease in pensioners	3,339	3,257	3,402
Net increase	3,737	3,710	3,217

Total benefit disbursements during September, 1944, amounted to $11,641,893, representing an *annual* level of $139,703,000. This was an increase of $4,984,000 in the *annual* level of disbursements, compared with September, 1943.

Progressively rising employment, increased wage rates, and greater payrolls were reflected in an increase in retirement tax accruals during 1944. These amounted during the first ten months of 1944 to $100,3000,000, compared with $88,200,000 during the corresponding period of 1943, an increase of 13.7 per cent.

A summary statement of retirement tax accruals, interest, and expenditures for the entire period of operation of the system from January, 1937, to September 30, 1944, follows:

		1937-44
Tax accruals		$1,306,000,000
Interest		27,326,824
		$1,333,326,824
Less		
Benefit payments	$857,656,813	
Administrative expenses	22,048,561	879,705,374
Balance		$453,621,450

The foregoing balance does not represent the actual balance to the credit of the Railroad Retirement Account, inasmuch as amounts transferred to that account from Congressional appropriations rather than tax collections are considered basic assets, and administrative expenses are not charged against the fund, but are met from appropriations by Congress for that specific purpose. The actual balance as of September 30, 1944, was $491,358,011, of which $490,000,000 was invested in 3 per cent Treasury notes.

Actuarial Valuation. The second actuarial valuation of the assets and liabilities of the railroad retirement system was made public in 1944. The Act provides that such valuations be made not less often than once every three years.

This second valuation, as of December 31, 1941, indicated that the present retirement tax schedule is insufficient to support the benefits provided by the Act, and that the annual deficiency amounts to slightly more than 3 per cent of the taxable payroll. A similar finding was made by the first valuation, as of December 31, 1938. In each instance, the Railroad Retirement Board has recommended that pending future developments, no immediate increase in the tax on payrolls be made. With respect to the second valuation, however, the chairman of the board, dissenting, recommended an immediate increase of 1½ per cent, divided equally between the carriers and their employees.

Railroad Unemployment Compensation. The rising trend in railroad employment in 1944 further reduced the already rapidly diminishing amount of unemployment benefit claims. The rate of this decline is indicated in the following tabulation, which shows the amount of unemployment benefits paid since July 1, 1939, the effective date of the Railroad Unemployment Insurance Act:

Fiscal year, 1939-1940	$14,809,692
" " 1940-1941	17,699,137
" " 1941-1942	8,890,442
" " 1942-1943	1,756,106
" " 1943-1944	552,410
July-September 1943	111,416
" " 1944	97,045

Unemployment insurance tax accruals, on the other hand, have continued to increase with rising payrolls. For the ten months ended October 31, 1944, they amounted to $92,608,000, compared with $81,447,000 for the same period of 1943, an increase of 13.7 per cent.

This constant and progressively widening spread between tax receipts and benefit disbursements further swelled the balance to the credit of the unemployment insurance reserve to more than $540,000,000 as of September 30, 1944.

A brief summary of the financial results of operation of the unemployment insurance system, for the entire period of operations from July 1, 1939, to September 30, 1944, is shown below:

Receipts:		
New tax contributions	$414,313,081	
Transfers from state accounts	106,077,938	
Transfers from administrative funds	38,030,880	
Interest on investments	25,969,308	
		$584,391,207
Expenditures:		
Net benefit payments		43,804,830
Balance, or reserve		$540,586,377

The net contributions shown in the foregoing tabulation represent 90 per cent of total tax collections, the remaining 10 per cent being transferred to an administrative fund. Administrative expenses for the entire period of operation, from July 1, 1939, to September 30, 1944, including expenditures on account of employment service operations, amounted to $17,914,510.

The board's employment service, which performs for the carriers the functions of manpower recruitment and employment stabilization under the War Manpower Commission program, was extremely active during 1944. A total of $693,567 placements were made during the nine months ended September 30, 1944, compared with a total of 215,760 for the same period of 1943.

The Competitive Situation

For the first time in history the total inter-city freight transportation service rendered in the United States exceeded one thousand billion ton-miles in 1943, and it is estimated that the corresponding figure for 1944 was slightly greater.

The railroad proportion of the total intercity freight traffic increased from 62 per cent in 1939 to 69 per cent in 1942, and to 71 per cent in 1943 and 1944.

In the passenger service the several agencies of transport excluding the private passenger automobile, handled a peak passenger business in 1944 of about 137 billion passenger-miles. The railroad proportion of commercial

intercity passenger traffic increased from 61 per cent in 1939 to 70 per cent in 1944. All commercial agencies of transport have shown large increases in the number of revenue passenger-miles handled since 1939.

Table XIII shows the trend in ton-miles handled by the principal agencies of transport.

Table XIII—Index Trend in Freight Ton-Miles

	Class I Railroads	Inland Waterways*	Pipe Lines	Trucks
1939	100.0	100.0	100.0	100.0
1940	111.9	122.7	106.6	118.6
1941	142.5	145.9	123.3	132.8
1942	191.3	154.3	133.9	116.8
1943	218.1	145.5	166.4	114.0
1944	221.9	140.3	182.2	109.3

* Great Lakes, rivers and canals.

The trend in passenger-miles handled by the principal commercial passenger handling agencies is shown in Table XIV.

Table XIV—Index Trend in Passenger-Miles

	Class I Railroads	Busses	Air Carriers
1939	100.0	100.0	100.0
1940	104.9	103.7	153.5
1941	129.6	121.9	202.1
1942	236.9	207.7	206.2
1943	387.7	276.8	236.9
1944	423.8	312.5	295.0

Air Transport

The House of Representatives in 1943 (H.R. 307) directed the Committee on Interstate and Foreign Commerce to make a study of present and probable future conditions and developments in and affecting air commerce. A subcommittee of that committee rendered its report on the subject September 18, 1944. This initial and incomplete report (No. 1893) recommended several changes in the Civil Aeronautics Act of 1938, also legislation to provide for the regulation of contract carriers by air. The subcommittee listed a number of steps that should be taken to develop private flying, and in general outlined what should be provided for the efficiency and safety of commercial air traffic. In addition, the committee recommended "That immediately there be planned a comprehensive national system of high-capacity airports."

On November 28, 1944, the Civil Aeronautics Administration (CAA) submitted to Congress its "National Airport Plan," developed as a result of the subcommittee's recommendations. The program calls for an outlay of $1,021,567,945, exclusive of land or airport buildings. Adding the approximate cost of land, airport buildings, and other airport facilities, the total cost of the program, which is designed to be spread over a 5- to 10-year period, would be about $1,250,000,000. The CAA suggests that one-half of the amount be borne by the Federal government, and one-half by the participating cities and towns.

Under the program 3,050 new airports would be constructed and 1,625 of the some 3,000 now existing fields would be improved, improvements to include clearing, grading, paving, lighting, and radio facilities.

Railroad Reorganizations

A total of 76 railroad companies, operating 51,799 miles of railroad, were in the hands of receivers or trustees at the end of 1944. Twenty-six of the 76 companies were Class I railways, operating 50,762 miles of line. Of these, four roads, operating 5,184 miles, were in receivership, while 22 roads, operating 45,578 miles of road, were in process of reorganization under the trusteeship provisions of Section 77 of the Bankruptcy Act.

A net reduction of six took place during 1944. Four Class I railways—Akron, Canton & Youngstown, Chicago & North Western, Minneapolis, St. Paul & Sault Ste. Marie, and Missouri-Illinois; and two Class II railways—Alabama, Tennessee & Northern, and Fonda, Johnstown & Gloversville—emerged from trusteeship.

In the case of the Missouri-Illinois, the court discharged the debtor company from trusteeship on a showing that its improved financial condition made unnecessary the continuation of such a proceeding.

Railroad reorganization in 1944 was characterized by the emergence from court control of an appreciable amount of railroad mileage, and by absence of new reorganization proceedings. Approximately 20 per cent of the Class I railway mileage in the hands of the courts at the beginning of 1944 was discharged during the year, and proceedings of other major companies were nearing completion. Resistance to Commission and court action was continued by various debtor companies and creditor groups, but in decreasing measure, due to clarification of some of the principal issues by decisions of the United States Supreme Court. Further attempts to salvage former stock holdings of debtor companies met with little success.

Substantial progress was made in advancing reorganization plans already before the Commission or the courts. The Seaboard Air Line Railroad made an appreciable advance in drawing to a close a receivership proceeding that has been in process since 1930.

No companies were discharged from receivership during the year, and no new proceedings were initiated in either trusteeship or receivership, although four companies, including one Class I railway and three leased lines, petitioned for transfer from receivership to trusteeship. Petitions for transfer to trusteeship were granted by the court to two of these companies, the Rutland Railroad and the Wisconsin Central.

One Class I voluntary debt adjustment is in process of consummation. The Baltimore & Ohio, proceeding under the provisions of Chapter 25 of the Bankrutpcy Act, submitted a debt adjustment plan to its security holders on November 1. This is in addition to the voluntary debt adjustment plan affected by this company in 1938.

Rates and Fares

Late in 1943 the Interstate Commerce Commission ordered a further suspension—to June 30, 1944—of the freight rate increases which were in effect from March 18, 1942, to May 15, 1943.

Under date of April 17, 1944, the Commission issued an order directing all interested parties to show cause why the Commission should not further suspend the originally authorized freight rate increases to January 1, 1945. The railroads' return to this "show cause" order consented to the entry by the Commission of a further suspension of 6 months or to January 1, 1945.

On September 13, 1944, the National Association of Railroad and Utilities Commissioners, and others, petitioned the Commission to require the railroads to show cause why the freight rate increases should not be permanently cancelled. On September 21 the Commission reopened the proceeding for further hearing, both as to the suspended freight rate increases, and increases in passenger fares.

Hearings were held during the latter part of October, followed by oral argument in early November. The Commission decided the case on December 12, and by a vote of 7 to 2 ordered a further suspension—to January 1, 1946—of the freight rate increases, but declined to

require the railroads to cancel the passenger fare increases. The proceeding is held open, so that any party may request further action if conditions substantially change.

Table XV shows the average revenue per ton-mile and per passenger-mile for the first nine months of 1944, the preceding five years, and for 1929.

Table XV—Revenue per Traffic Unit

Year	Per ton-mile (cents)	Per Passenger-mile (cents)
1944 (9 mos.)	0.942	1.874
1943	0.933	1,882
1942	0.932	1,916
1941	0.935	1,753
1940	0.945	1.754
1939	0.973	1.839
1929	1,076	2.808

Average revenue per ton-mile in 1944—0.942 cents for nine months—was slightly greater than in the preceding four years, due to an increased proportion of higher rated commodities transported for war purposes.

Average revenue per passenger-mile amounted to 1.874 cents in 1944, slightly less than in 1942 and 1943, and very much below the average for 1929.

Inasmuch as unit costs of labor and material and supplies are higher than they were in 1940 by more than 25 per cent, and freight rates have not risen above the 1940 levels, only the unprecedented volume of traffic enabled the railroads to show relatively favorable operating results.

Financial Results

The following four tables, XVI to XIX, compare the income and outgo of the railroads in 1944 with those of 1943. All entries for 1944 relate to the 12 months ended October 31, 1944, while the entries for 1943 are for that calendar year.

Table XVI is a condensed railway income account, comparing the returns for 1944 with those of 1943. Net railway operating income is after taxes. The net income shown is after fixed and contingent charges.

Table XVI—Condensed Income Account

	1944 (millions)	1943 (millions)
Total operating revenues	$9,444	$9,055
Total operating expenses	6,303	5,657
Operating ratio—per cent	66.7	62.5
Tax accruals	1,834	1,849
Net railway operating income	1,109	1,360
Net income	652	873

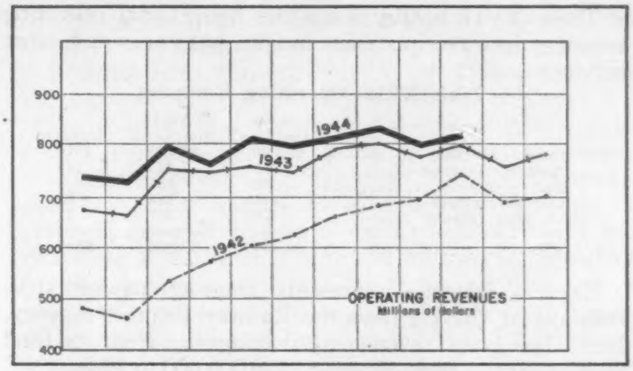
Total operating revenues for 1944 amounted to nearly 9½ billion dollars, an increase of $400,000,000 over 1943, or 4.3 per cent.

Total operating expenses in 1944 amounted to six and one-third millions dollars, an increase of $650,000,000 over 1943, or 11.4 per cent. It is significant that it cost 650 millions more in 1944 than in 1943, to earn a greater revenue of only 400 millions.

The operating ratio in 1944 averaged 66.7 per cent, compared with 62.5 per cent in 1943. This higher ratio reflects increases in wage rates, and increased unit costs of materials and supplies.

Taxes for the 12 months ended October 31, 1944, amounted to $1,834,000,000. Tax accruals for the calendar year 1944, when finally reported, may be as great as, or slightly greater, than the total reported for 1943.

Net railway operating income and net income for the 12 months ended October 31, 1944, were both less than in 1943. In fact, net earnings for the railways showed declines for the second consecutive year, notwithstanding a sizable increase in gross revenues during the same period.



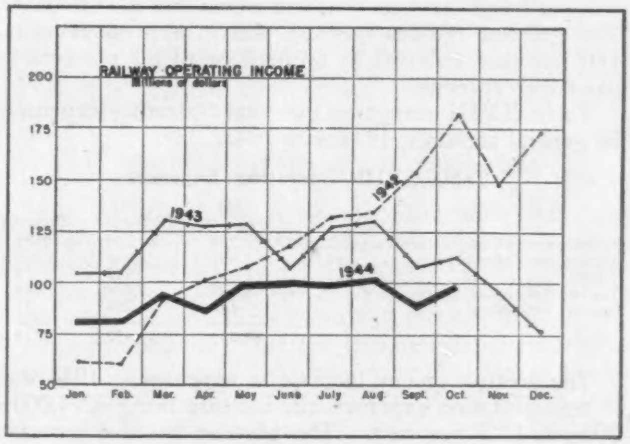


Chart E—Monthly Trend in Operating Revenues and Net Operating Income 1942, 1943 and 1944

In its Ex Parte No. 148 decision of December 12, the Interstate Commerce Commission included estimates of railroad revenues and expenses for the calendar year 1944, based upon a projection of the returns for the first 10 months of that year. These estimates compare rather closely with the totals for the 12 months ended October 31, 1944, shown above in Table XVI with only slight changes in the net results, as follows:

	Increase in Millons ICC over 12 months to Oct. 31
Total operating revenues	$50
Total operating expenses	51
Tax accruals	71
Net railway operating income	38
Net income	15

Comparison of 1944 against 1929 brings into strong relief the increased cost of railroad operations in 1944. Although operating revenues were greater in 1944 than in 1929 by $3,164,000,000, all that increase and more was absorbed in 1944 by the increased payroll, increased material costs, and greatly increased taxes. The result was that net railway operating income in 1944 was actually less than in 1929 by $143,000,000. In relative terms, it took $5.02 of gross in 1929 to earn one dollar in net railway operating income, whereas the corresponding figure in 1944 was $8.52.

Operating revenues were greater in 1944 than in 1942 by two billion dollars, but net income, after all charges, was less in 1944 than in 1942 by $250,000,000. This decline in net income occurred in spite of the carriers' program to reduce funded debt and interest charges. The fixed interest charges of railways of Class I, not in receivership or trusteeship, were about $25,000,000 less in 1944 than they were in 1942.

Table XVII breaks down the figure total operating revenues into receipts from freight, passenger and other services.

Table XVII—Operating Revenues

	1944 (millions)	1943 (millions)	Increase
Freight revenue	$6,996	$6,782	$214
Passenger revenue	1,797	1,653	144
Mail revenue	130	125	5
Express revenue	143	128	15
All other revenue	378	367	11
Total	$9,444	$9,055	$389

Express revenue represents contract payments to railways of Class I from the Railway Express Agency, Inc. The gross revenue of that agency from its total express service approximated $390,000,000 in 1944.

The greatest money increase in 1944 revenues took place in freight revenue, with an increase of $214,000,000. The greatest relative increase was in express revenue, 11.7 per cent, followed by an increase of 8.7 per cent in passenger revenue.

Table XVIII compares the total operating expenses, by general accounts, 1944 with 1943.

Table XVIII—Operating Expenses

	1944 (millions)	1943 (millions)	Increase
Maintenance of way & structures	$1,280	$1,108	$172
Maintenance of equipment	1,602	1,440	162
Traffic	136	129	7
Transportation	2,960	2,686	274
General and other	325	294	31
Total	$6,303	$5,657	$646

The greatest money increase in expenses in 1944 was in transportation expenses, the increase being $274,000,000, or 10.2 per cent. The greatest relative increase was that of 15.5 per cent in maintenance of way.

Chart E portrays the monthly trend in total operating revenues and in net railway operating income for each month from January, 1942, to October, 1944.

Operating revenues have shown a tendency to flatten out, although for each month of 1944 they were slightly greater than for the corresponding month of 1943.

Net railway operating income, however, has shown a decrease for each and every month since June, 1943. The same has been true of net income after fixed charges.

Table XIX shows total operating revenues, net railway operating income, the rate of return on property investment, and the net income after charges, for the twelve months ended October 31, 1944, compared with the five preceding calendar years and with 1929.

Table XIX—Gross and Net Earnings

Year	Total Operating Revenues (millions)	*Net Railway Operating Income* Amount (millions)	Rate of return (per cent)	Net Income (millions)
1944	$9,444	$1,109	4.05	$652
1943	9,055	1,360	4.92	8.73
1942	7,466	1,485	5.50	902
1941	5,347	998	3.75	500
1940	4,297	682	2.59	189
1939	3,995	589	2.25	93
1929	6,280	1,252	4.81	897

Capital Expenditures and Purchases

Table XX shows gross expenditures for capital improvements to railroad properties and amounts spent for fuel, material and supplies, by Class I railways, during each of the ten years 1935 to 1944, inclusive.

Gross capital expenditures in 1944 approximated $550,000,000, an increase of about $100,000,000, or 20 per cent, over 1943. Increased installation of new freight cars and new locomotives was the primary reason for the greater expenditure, although increased labor costs and unit prices also had their effect.

Capital expenditures during the past four years, 1941-1944, aggregated close to $2,100,000,000, an amount slightly greater than the total for the preceding six years, 1935 to 1940. Even so, capital expenditures have been on a restricted basis during the war period because of critical shortages in both labor and materials.

Table XX—Capital Expenditures and Purchases

Year	Gross Capital Expenditures (thousands)	Purchases of fuel, material and supplies (thousands)
1944 (est.)	$550,000	$1,600,000
1943	454,282	1,394,281
1942	534,897	1,259,811
1941	543,021	1,161,274
1940	429,147	854,463
1939	262,029	769,314
1938	226,937	583,282
1937	509,793	966,383
1936	298,991	803,421
1935	188,302	593,025
Total—10 years	$3,997,399	$9,985,254

Purchases of fuel, materials and supplies in 1944 approximated $1,600,000,000, an increase of about 15 per cent over 1943. Both greater consumption and increased prices were responsible for the increase.

Operating Efficiency and Economy

The significant factors of railway operating efficiency are given in a number of subsequent statistical tables. Table XXI shows the average number of gross and net ton-miles per freight train hour. Both of these factors attained record levels in 1944. Gross ton-miles include the weight of cars and contents, while net ton-miles represent weight of lading only, including both revenue and nonrevenue freight.

Table XXI—Ton-miles per Freight Train-hour

Year	Gross ton-miles	Net ton-miles
1944 (10 mos.)	37,548	17,745
1943	35,968	16,995
1942	35,503	16,132
1941	34,684	14,930
1940	33,811	14,028
1939	32,808	13,450
1929	24,539	10,580

The average number of gross ton-miles per freight train-hour was greater in 1944 than in 1939 by 14.4 per cent, which represents the extent of improvement during the war period. Net ton-miles per train-hour increased 31.9 per cent during the same period. These increases were in addition to very considerable increases that had been effected during the decade from 1929 to 1939. The greater relative increase in net ton-mile than in gross ton-mile performance from 1939 to 1944 reflects the increased loading per train that has been a feature of the movement of war traffic.

Table XXII shows the average daily mileage of active locomotives and freight cars. Active locomotives are serviceable units less those reported as stored. Active freight cars are serviceable units, less those classified as surplus.

Table XXII—Daily Mileage of Locomotives and Cars

Year	Miles per day per active unit: Freight Locomotives	Passenger Locomotives	Freight Cars
1944 (10 mos.)	123.5	222.2	52.8
1943	124.5	220.9	52.0
1942	122.4	206.8	50.3
1941	116.4	195.6	45.7
1940	107.5	190.8	42.2
1939	104.4	184.2	40.6
1929	91.2	164.5	38.7

Here, again, considerable improvement has been effected during the five years of the war period, 1939 to 1944, on top of increases already made between 1929 and 1939. Daily mileage of freight locomotives increased 18.8 per cent between 1939 and 1944, passenger locomotive mileage per day increased 20.6 per cent, and freight car mileage per day increased 30.0 per cent.

The greater movement of freight cars was especially significant, reflecting as it does the more intensive use of the *average* car.

Table XXIII shows average freight and passenger train speed, based on the average elapsed time of trains between initial and final terminals, including all road delays. Here heavy traffic density in the last three years has tended to a slowing down process, although 1944 made a slightly better showing than 1943.

Table XXIII—Average Train Speed (MPH)

Year	Freight Train	Passenger Train
1944 (10 mos.)	15.7	35.9
1943	15.4	35.7
1942	15.8	36.9
1941	16.5	37.6
1940	16.7	37.3
1939	16.7	36.0
1929	13.2	...

Table XXIV shows the average train and car load, for both freight and passenger services. Unsurpassed records were set up in 1944 for both freight and passenger train loading.

Table XXIV—Train and Car Load

	Freight Service		Passenger Service	
Year	per train	per car	Passengers per train	Passengers per car
1944 (10 mos.)	1,144	32.8	*203.1	*32.6
1943	1,116	33.4	189.5	31.1
1942	1,035	31.8	125.5	23.1
1941	915	28.5	73.2	15.8
1940	849	27.6	60.7	13.8
1939	813	26.9	58.0	13.4
1929	804	26.9	55.0	11.7

* 9 months.

The freight train load in 1944 was 1.4 times the train load of 1939. Prior to 1939, the average train load had exceeded 800 tons only once, in 1929. The passenger train load in 1944 was 3½ times as great as the 1939 average.

Table XXV relates to locomotive fuel consumption. It shows the amount of traffic handled per ton of locomotive fuel consumed, both in freight and passenger service. In this field, the passenger performance was the best on record; the freight performance showed improvement between 1943 and 1944.

Table XXV—Locomotive Fuel Performance

Year	Gross ton-miles per ton of fuel (Freight service)	Passenger train car-miles per ton of fuel (Passenger service)
1944 (10 mos.)	17,705	136
1943	17,573	133
1942	18,069	133
1941	18,085	133
1940	17,839	133
1939	17,774	135
1929	16,007	134

Improvement in accident and casualty rates occurred during the year. Comparing the first ten months of 1944 with the corresponding period of 1943, the number of train accidents was about the same, while locomotive-miles, the unit of measurement for such accidents, increased slightly; the number of passenger fatalities in train and train-service accidents declined 8.6 per cent, and non-fatal injuries to passengers declined 9.5 per cent, while passenger-miles increased by about 11 per cent; casualties to employees on duty increased 3 per cent, while man-hours on duty increased about 5 per cent; grade crossing casualties were about the same as in 1943, while trespasser casualties showed a substantial decline.

Conclusion

Railroads have written another fine chapter in their record of service to the nation. They will continue to serve the war and civilian effort throughout the progress of the war, in both the European and Pacific areas and on other war fronts.

For the near future, military developments toward the end of the year 1944 foreshadowed a longer war in Europe than had at one time been anticipated. This would indicate continued heavy production of certain war materiel beyond the date when it had been expected that drastic cutbacks could be effected. Although the result of these developments cannot be determined with exactness at this time, in terms of railroad traffic volume in 1945, it seems likely that the decrease in that volume may not be so great as it would have been had the end of the war in Europe, the so-called V-E Day, been attained in 1944. The immediate future is full of uncertainties, both military and civilian, involving as it does the difficult task of so decelerating war production and at the same time accelerating civilian production as to cause the smallest degree of unsettlement in production and in employment, what some have termed "disemployment."

Traffic May Ease Off Somewhat

On the whole, and after appraising all the complex elements that enter into the prospective situation, it appears reasonably certain that railroad freight and passenger traffic will be less in 1945 than in 1944. Ton-miles had already turned down in the last half of 1944, and indications are that the decline will continue. Passenger-miles showed a decrease in at least two of the last six months in 1944, and the level of passenger traffic in those six months was only slightly above 1943, contrasted with an increase of nearly 19 per cent in the first six months. Even with the war on all fronts continuing into 1945, there is little reason to believe that the downward trends which were definitely developing in the latter part of 1944 will not carry over in 1945, and in a somewhat more striking manner. The specific percentages of decrease for the year 1945 as a whole still lie in a rather speculative field.

Assuming that the Pacific war continues through 1945 and into 1946, war traffic movement will still be heavy in 1946, but on a considerably lower level than in 1945. The total volume of traffic in that year will doubtless drop appreciably below 1945, the extent of the decline depending in part on the then war situation and in part on the relative rapidity or slowness of the process of reconversion to civilian production.

Whatever the traffic and consequent revenue decreases may prove to be, in 1945 and 1946, the adverse impact on net earnings will be heavy. Even a considerable increase in gross revenue in 1944 failed to stem the downward trend in net, and when gross revenue itself turns down, the effect on the decline in net will tend to be cumulative. This prospect, unfortunately, is one of the few certainties that confront the rail industry.

For the longer look ahead, a number of estimates of future rail traffic have already been made, by the research staff of the Interstate Commerce Commission, by the Railroad Retirement Board, by other government agencies, and by several private groups. These estimates vary, but some of them group themselves around the conclusion that railroad traffic and revenues in the three years following the war will be in the neighborhood of those experienced in 1941. Revenue ton-miles in 1941, it will be recalled, aggregated 475 billion, about six per cent above 1929; passenger-miles aggregated slightly more than 29 billion, about six per cent below 1929; gross revenues were 5⅓ billion dollars, about 15 per

(*Continued on page 89*)

FINANCES *on mend but still feeble*

Investment leaders cheered by roads' improved "defenses" but aren't eager to put up equity money for a. & b. program

By J. G. LYNE
Assistant to Editor

THE selling price of railway securities improved materially during 1944, but the carriers still have a long way to go before, generally speaking, they can again hope to raise substantial sums of money for new additions and betterments by the sale of securities in the private capital market. Leading investors themselves—in the persons of the railroad securities committee of the Investment Bankers Association (of which committee Fairman R. Dick of the firm of Dick & Merle-Smith is chairman)—have recently made known what they think about these securities, namely, that they regard the improvement which has occurred as primarily "defensive." By this is meant that the railroads have strengthened their position against a disastrous decline in earnings, such as that which produced so many bankruptcies in the 1930's, but have not put themselves in a position to command a large volume of new capital.

Debt Retirement Continues

During 1944 the railroads continued their program of devoting a large part of their earnings to the retirement of debt and to increasing their working capital. Moreover, wherever conditions have been favorable, the maturity of indebtedness during the next five years or more has been anticipated by advance refinancing or redemption. In the words of the Investment Bankers' railroad committee:

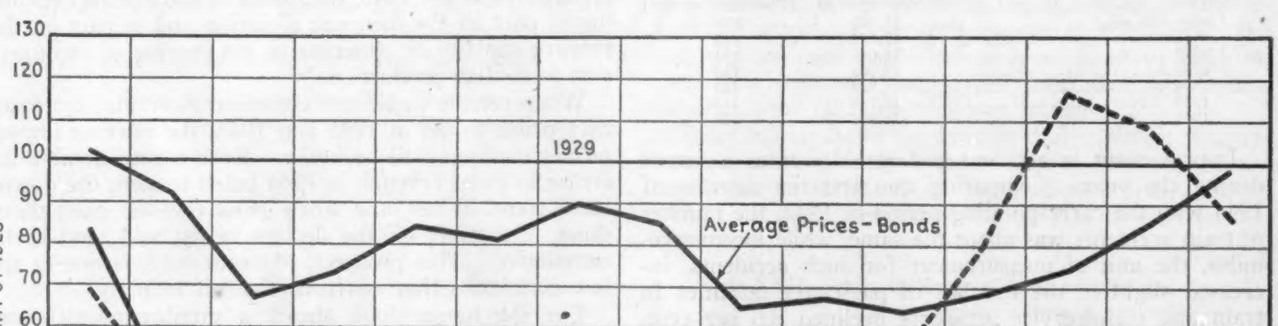
"Many roads which were in serious difficulties during the 1930's are in a far stronger defensive position today than they were at the start of the depression. Even in roads where the selling prices of bonds indicate serious danger of bankruptcy, financial strength today is far greater than it was in the 1930's. . . .

"Examples of the present strength of individual railroads today cannot be regarded as illustrating what the strength of these roads will be at the time of a post-war depression if one should occur. This is because gains in financial strength are currently continuing at a rapid pace and a termination of the cash income that permits further gains is not yet in sight.

"Even if the war ends early in 1945 and earnings decline, the decline in net before federal income taxes can be substantial before the net earnings after federal taxes of most railroads are seriously affected. This is because under the excess profits tax law, a drop in net is compensated for to the extent of approximately 85 per cent by a reduction in income taxes until the net before taxes reaches the level of excess profits tax exemption. In the event that earnings drop below the excess profits tax exemption, cash earnings should nevertheless hold up reasonably well because, for a two-year period, the law provides for certain tax refunds of excess profits taxes paid in prior years. . . .

"Unfortunately, the great defensive strength of our carriers today cannot be regarded as evidence of what might be termed 'offensive' strength, that is, ability to

Statistical tables for this article were compiled by Edith Stone, *Railway Age's* librarian, and by Marion Odomirok.



Railway Age average prices of 20 representative stocks and 20 bonds.

Fluctuations in Earnings Are No Longer a Major Determinant of Security Price Changes

New Issues of Railroad Securities Offered for Sale in the United States†
1934-1944
(Amounts in thousands of dollars)

Year	Bonds	Stock	Railroad total	Total all industries	Railroad as per cent of total
1934	$176,423	....	$176,423	$397,240	44.4
1935	126,031	....	126,031	2,331,630	5.4
1936	793,618	$3,838	797,456	4,571,670	17.4
1937	344,257	....	344,257	2,309,524	14.9
1938	54,873	....	54,873	2,154,664	2.5
1939	185,474	233	185,707	2,164,007	8.6
1940	323,912	....	323,912	2,677,173	12.1
1941	366,313	....	366,313	2,666,887	13.7
1942	47,726	....	47,726	1,062,288	4.5
1943	161,179	....	161,179	1,169,692	13.8
1944*	477,391	350	477,741	2,513,863	19.0

* 10 months total.
† Compiled by Securities and Exchange Commission.

raise large sums for improvement by the issuance of new securities—stocks and bonds. . . ."

The Investment Bankers' railroad committee weighed the various estimates which have been made of the sums which the railroads should spend for desirable improvements, and reached the conclusion that "at least $10 billions" could be amply justified for this purpose in the decade following the war. Turning to the ability of the railroads to finance such a program, the committee noted that depreciation charges on equipment amount to approximately $200 millions annually. Even after about $70 millions are deducted for maturing equipment obligations, a substantial sum still remains for equipment replacement. Some additional funds from working capital, could be provided for improvements, although the Investment Bankers do not expect that management, with the experiences of the 1930's still fresh in its mind, will view material reduction in working capital with much enthusiasm. A third source of self-financing, namely, current earnings, could be added to the two already mentioned, but the funds made available by all three of these sources "would fall far short of the amount necessary to carry out the desired program."

Small Chance for New Money

As to the possibility of raising the money by the old-fashioned forthright method of selling new securities to investors, the Investment Bankers' railroad committee is pessimistic. If the railroads should cease to use a substantial part of their earnings for debt retirement, as they are doing today, and, instead, should seek to increase their outstanding fixed-interest obligations, the result would be to "shatter" railroad credit. The committee goes on to explain:

"Credit can be described as the state of mind of investors, and in their present state of mind a definite program of weakening capital structures would properly be described as terrifying.

"Even if investor confidence improves so that it becomes possible to market a limited amount of new fixed interest bonds for improvements, the money raised by such financing could only be a small part of the desired expenditures. The reason for this is because present standards as to a proper burden of debt are so low and conservative."

Equipment Trusts' Potentialities Have Limits

Railroad equipment trust certificates are such popular securities, that question is seldom raised of the carriers' ability to get with ease all the money they can use for the purchase of equipment—but the Investment Bankers' railroad committee does not share this opinion. If, of the proposed expenditure by the railways of $10 billions for additions and betterments, one-half or $5 billions should be allocated to purchases of new equipment "annual maturities and interest would be in the neighborhood of $500,000,000 a year. A short-term fixed maturity of an equipment trust is in effect a fixed charge. The issuance of $5 billions in equipment trusts, therefore, would almost double the fixed charges of our railroads. . . . It is clear that only a small fraction of the new money involved for an equipment modernization program can be wisely raised by the sale of equipment trusts." Continuing, the Investment Bankers conclude:

"We now come to the possibility of raising new funds by selling securities which do not bear a fixed charge, that is, by the sale of income bonds, preferred stocks,

Railroads Taken from Receivership or Trusteeship During 1944

Name of Road	Mileage Operated
Akron, Canton & Youngstown	171
Northern Ohio	—
Alabama, Tennessee & Northern	218
Chicago & North Western	8,101
Fonda, Johnstown & Gloversville	20
Minneapolis, St. Paul & Sault Ste. Marie	3,219
Missouri-Illinois	172
South Dayton	—*
Western Pacific	1,195
Total	13,096

* Removed from receivership in 1943.

Representative Equipment Trust Issues Sold in 1944

Road	Maturity	Amount	Int. Rate %	Sold to Banker: Price	Sold to Banker: Cost	Purchaser
Alton	1945-1954	$3,675,000	2¼	99.321	2.39	Harris, Hall & Co.
Central of Pennsylvania	1945-1959	3,720,000	2¼	99.76	2.28	Halsey, Stuart & Co., et. al.
Chesapeake & Ohio	1945-1954	2,200,000	1¾	100.27	1.70	Halsey, Stuart & Co.
Chesapeake & Ohio	1945-1954	2,500,000	1¾	100.0875	1.73	Halsey, Stuart & Co.
Chesapeake & Ohio	1945-1954	2,500,000	1¾	100.10	1.73	New York Trust Co.
Chesapeake & Ohio	1945-1954	2,500,000	1¾	99.75	1.80	Halsey, Stuart & Co., et. al.
Chesapeake & Ohio	1945-1954	2,200,000	1¾	99.807	1.79	National City Bank of Cleveland, et al.
Chesapeake & Ohio	1945-1954	3,600,000	1¾	99.901	1.77	Marine Midland Trust Co. of New York, et al.
Chicago & North Western	1945-1954	5,180,000	1¾	99.229	1.90	Halsey, Stuart & Co., et. al.
Chi., Burlington & Quincy	1945-1954	1,520,000	1⅞	100.13	1.85	First National Bank of Chicago, et al.
Chi., Mil., St. P. & Pac., Ser. X	1944-1954	7,260,000	1⅞	100.0056	1.87	First National Bank of Chicago, et al.
Erie	1945-1954	3,620,000	1⅞	100.1285	1.85	Guaranty Trust Company of New York
Illinois Terminal, Ser. B	1945-1954	690,000	2	100.3677	1.92	First National Bank in St. Louis
New York Central	1945-1954	15,500,000	1⅞	99.5391	1.97	Salomon Bros. & Hutzler, et al.
New York, Chicago & St. L.	1945-1954	1,800,000	1¾	99.777	1.79	Mfr.'s & Traders Trust Co. of Buffalo, N. Y.
New York, Chicago & St. L.	1945-1954	2,100,000	1⅞	99.882	1.90	Cleveland Trust Co.
Pennsylvania, Ser. O	1945-1959	4,155,000	2¼	100.739	2.15	Halsey, Stuart & Co., et. al.
Pere Marquette	1945-1954	2,220,000	2¼	99.69	2.29	Halsey, Stuart & Co., et. al.
Seaboard Air Line, Ser. MM	1945-1954	2,760,000	2	99.531	2.10	Harris, Hall & Co., et al.
Union Pacific, Ser. H	1945-1954	8,120,000	1¾	100.276	1.70	Halsey, Stuart & Co., et. al.
Wheeling & Lake Erie, Ser. J	1945-1954	1,140,000	*	99.13	1.67	Halsey, Stuart & Co.
Wheeling & Lake Erie, Ser. K	1945-1954	920,000	†	99.22	1.70	Halsey, Stuart & Co.

* Payable semi-annually on February 1 and August 1, according to maturity as follows: Feb. 1, 1945 to Feb. 1, 1946, 2¾%; Aug. 1, 1946 to Aug. 1, 1947, 2½%; Feb. 1, 1948 to Feb. 1, 1949, 2¼%; Aug. 1, 1949 to Feb. 1, 1950, 2%; Aug. 1, 1950 to Aug. 1, 1951, 1½%, and Feb. 1, 1952 to Aug. 1, 1954, 1%.

† Payable semi-annually on March 1 and September 1, according to maturity as follows: Mar. 1, 1945 to Mar. 1, 1946, 2½%; Sept. 1, 1946 to Sept. 1, 1947, 2¼%; Mar. 1, 1948 to Mar. 1, 1949, 2%; Sept. 1, 1949 to Mar. 1, 1950, 1¾%; Sept. 1, 1950 to Sept. 1, 1951, 1½%, and Mar. 1, 1952 to Sept. 1, 1954, 1¼%.

or common stocks. It requires but a glance at the quotation sheet to see that raising new funds in this manner is today wholly impractical. Income bonds are today selling at discounts of 40 to 60 per cent, and common stocks, as far as new financing is concerned, must be regarded as selling for nothing. This is because, in order to raise even a modest sum, the volume of new stock that it would be necessary to sell would be so large as to destroy its acceptability to investors. . . .

"If, prior to a post-war decline in traffic, rates are raised to compensate for increased costs, the situation can be saved. . . . Today, if earnings collapse, our rail-

Railroads in the Hands of Receivers or Trustees on December 31, 1944

Road	Mileage operated	Mileage owned	Date of receivership or trusteeship	Long term debt in hands of public	Capital stock in hands of public	Total securities in hands of public	Receiver's or trustee's certificates in hand of public	Principal amount of obligations in default as to principal and/or interest
Alton	959	654	Nov. 25, 1942	$49,773,722	None	$49,773,722	None	$45,350,000
Kansas City, St. Louis & Chicago	....	157	Apr. 30, 1943	None	1,864,200	1,864,200	None	None
Louisiana & Missouri River	....	76	Feb. 17, 1944	None	344,300	344,300	None	None
California & Oregon Coast	14	14	Feb. 19, 1925	25,000	None	25,000	None	25,000
Catonsville Short Line	....	4	Jan. 1, 1942	None	2,200	2,200	None	None
Central of Georgia	1,816	1,405	Dec. 19, 1932(a)	51,399,467	None	54,791,886	3,716,638	51,399,467
Central Railroad or New Jersey	654	374	Oct. 31, 1939	50,751,382	11,942,800	62,694,182	None	48,731,000
Chicago, Indianapolis & Louisville	541	512	Dec. 30, 1933	26,071,000	1,818,000	30,211,755	None	26,071,000
Chicago, Milwaukee, St. Paul & Pacific	10,723	9,754	June 29, 1935	445,627,417	224,406,957	673,534,374	21,252,000	262,314,924(b)
Chicago, Rock Island & Pacific	7,751	4,921	June 7, 1933	268,766,300	128,892,512	397,658,812	7,961,265	174,957,300
Chicago, Rock Island & Gulf	....	635	Oct. 31, 1933	None	None	None	None	None
Choctaw, Oklahoma & Gulf	....	785	Oct. 31, 1933	8,935,000	None	8,935,000	None	None
Peoria Terminal	29(c)	27(c)	Oct. 31, 1933	930,000	None	930,000	None	930,000
Rock Island, Arkansas & Louisiana	....	376	Aug. 31, 1933	11,453,600	None	11,453,600	None	11,453,600
Rock Island, Memphis Terminal	....	6(c)	Oct. 31, 1933	None	None	None	None	None
Rock Island, Omaha Terminal	....	3(c)	Oct. 31, 1933	None	None	None	None	None
Rock Island, Stuttgart & Southern	....	21	Oct. 31, 1933	None	None	None	None	None
St. Paul & Kansas City Short Line	....	417	Aug. 31, 1933	18,424,115	None	18,424,115	None	18,424,115
Denver & Rio Grande Western	2,398	2,102	Nov. 1, 1935	124,882,000	13,754,400	142,121,400	None	120,216,000
Denver & Salt Lake Western	....	38	Nov. 1, 1935	None	None	3,110,850	None	None
Duluth, South Shore & Atlantic	550	447	Jan. 2, 1937	3,822,000	10,827,500	14,649,500	None	3,822,000
Mineral Range	26	26	June 1, 1937	317,071	705,800	1,022,871	None	317,071
Florida East Coast	682	676	Sept. 1, 1931(d)	57,890,000	37,500,000	95,390,000	None	45,000,000
Georgia & Florida	408	363	Oct. 19, 1929	8,253,919	13,382,441	21,991,081	600,000	8,253,919
Hoboken Manufacturers	9	2	July 27, 1943	100,000	400,000	500,000	None	100,000
Meridian & Bigbee River	50	50	June 15, 1933	500,000	300,000	800,000	925,000	500,000
Middletown & Unionville	14	13	Aug. 17, 1943	350,500	150,000	500,500	None	185,000
Missouri Pacific	7,082	6,551	Apr. 1, 1933	372,014,600	154,639,600	557,651,110	None	359,791,600
Boonville, St. Louis & Southern	....	0.18	June 1, 1936	30,000	None	30,000	None	30,000
Cairo & Thebes	....	25	Dec. 1, 1937	1,699,000	None	1,699,000	None	1,699,000
Chester & Mount Vernon	....	64	Dec. 1, 1937	None	None	None	None	None
Fort Smith Suburban	....	7	Dec. 1, 1937	None	None	None	None	None
Marion & Eastern	....	3	Dec. 1, 1937	None	None	None	None	None
Missouri Pacific R.R. Corp. in Nebr.	....	....(e)	May 1, 1933	None	None	None	None	None
Natchez & Southern	7	7	Dec. 1, 1937	None	None	None	None	None
New Orleans, Texas & Mexico	191	173	Apr. 1, 1933	42,970,000	859,800	43,829,800	None	42,970,000
Asherton & Gulf	32	32	Dec. 1, 1937	None	None	None	None	None
Asphalt Belt	18	18	Dec. 1, 1937	None	None	None	None	None
Beaumont, Sour Lake & Western	146	84	May 1, 1933	None	None	None	None	None
Houston North Shore	....	27	May 1, 1933	None	None	None	None	None
Houston & Brazos Valley	37	37	Dec. 1, 1937	None	None	None	None	None
International-Great Northern	1,155	1,101	Apr. 1, 1933	44,927,700	None	45,334,788	None	44,927,700
Austin Dam & Suburban	....	2(f)	Dec. 1, 1937	None	None	None	None	None
New Iberia & Northern	104	65	Dec. 1, 1937	None	None	None	None	None
Iberia, St. Mary & Eastern	....	39	Dec. 1, 1937	None	None	None	None	None
Orange & Northwestern	62	62	Dec. 1, 1937	None	None	None	None	None
Rio Grande City	18	18	Dec. 1, 1937	None	None	None	None	None
St. Louis, Brownsville & Mexico	606	560	May 1, 1933	None	None	None	None	None
San Antonio Southern	45	29	Dec. 1, 1937	None	None	None	None	None
San Antonio, Uvalde & Gulf	317	24	May 1, 1933	None	None	None	None	None
San Benito & Rio Grande Valley	116	116	Dec. 1, 1937	None	None	None	None	None
Sugar Land	42	19	Dec. 1, 1937	None	None	None	None	None
Murfreesboro-Nashville	15	15	Sept. 5, 1942	25,000	16,000	41,000	None	25,000
New Jersey & New York	39	29	July 1, 1938	1,022,960	368,400	1,391,360	None	1,022,960
New York, New Haven & Hartford	1,816	1,158	Oct. 23, 1935	247,840,982	206,155,300	460,720,654	None	178,063.646
Hartford & Connecticut Western	....	19	July 31, 1936	None	338,200	338,200	None	None
Old Colony	....	448	June 2, 1936	14,348,000	12,500,800	28,248,800	None	14,348,000
Boston & Providence	....	61	Aug. 5, 1938	2,170,000	3,668,800	5,838,800	None	2,170.000
Providence, Warren & Bristol		13	Feb. 13, 1937	None	44,900	44,900	None	None
New York, Ontario & Western	546	327	May 20, 1937	32,413,656	58,114,043	90,527,699	68,746	32,168,656
New York, Susquehanna & Western	120	120	June 1, 1937	12,927,592	None	12,927,592	None	12,345,608
Pittsburg, Shawmut & Northern	190	156	Aug. 1, 1905	14,655,600	15,000,000	29,655,600	2,044,350	14,655,600
Rio Grande Southern	172	172	Dec. 16, 1929	2,728,000	930,300	3,658,300	None	2,728,000
Rutland	407	393	May 5, 1938(g)	9,216,000	9,080,300	18,296,300	None	9,216,000
St. Louis-San Francisco	4,926	4,856	Nov. 1, 1932(h)	263,823,597	114,701,526	383,661,987	None	261,588,597
St. Louis Southwestern & Affiliated Cos.	1,607	1,413	Dec. 12, 1935	51,883,395	4,733,500	79,646,779	None	30,564,395
Seaboard Air Line	4,174	3,300	Dec. 23, 1930	161,002,724	84,964,792	245,967,516	5,000	145,193,724
Georgia, Florida & Alabama	....	130	Nov. 7, 1931(i)	199,000	1,500,000	1,699,000	None	199,000
Seaboard-All Florida	....	162	Feb. 2, 1931	3,665,750	None	3,665,750	None	3,665,750
East and West Coast	side track		Feb. 2, 1931	166,647	None	166,647	None	166,647
Florida Western & Northern	....	233	Feb. 2, 1931	3,811,103	None	3,811,103	None	3,811,103
Tampa Northern	2	49	May 7, 1942	1,258,000	None	1,258,000	None	1,258,000
Tallulah Falls	57	57	June 25, 1923	None	None	None	None	None
Virginia & Truckee	46	46	Apr. 27, 1938	None	5,000,000	5,000,000	None	None
Waco, Beaumont, Trinity and Sabine	41	41	Feb. 8, 1930	None	None	None	12,734	None
Yosemite Valley	78	78	Jan. 29, 1937	2,318,000	None	2,318,000	None	2,318,000
Yreka Western	8	8	Sept. 16, 1935	None	None	None	34,950	None
Wisconsin Central	1,122	984	Dec. 2, 1932(j)	34,911,716	11,391,700	46,303,416	None	33,513,000

(a) Changed to trusteeship June 19, 1940.
(b) Does not include 5% Convertible Adjustment Mortgage Bonds in the principal amount of $182,873,693, interest on which is cumulative and matures with the principal on January, 2000, unless previously earned and declared payable.
(c) Yard tracks and sidings.
(d) Changed to trusteeship Apr. 21, 1941.
(e) Included in Missouri Pacific R.R. Co.
(f) Yard switching tracks.
(g) Changed to trusteeship July 21, 1944.
(h) Changed to trusteeship May 16, 1933.
(i) Changed to trusteeship Aug. 17, 1944.
(j) Changed to trusteeship Oct. 1, 1944.

Note:—The effort has been made, in the above table, to list only those securities of bankrupt carriers which are actually in the hands of the investing public—and to exclude securities of one carrier held by an affiliated carrier. Where securities are held by other railways not affiliated with the issuing company, however, they are included in the above list as publicly held. Owing to the complexities of some corporate structures, the decision as to the fact of public or other-carrier ownership has preforce, in some instances, been arbitrary. The purpose has been to give a general picture of the public stake in bankrupt carriers rather than a comprehensive tabulation of legal obligations.

Mileage in the Hands of Receivers or Trustees

(Figures to 1943, Inclusive, from I. C. C. Statistics for Year Ended December 31, 1943. Figures for 1944 Compiled by *Railway Age*.)

Year ended	Miles of road operated by receivers or trustees at close of year	Net change during year in miles of road operated	No. of roads in charge of receivers or trustees at close of year
June 30, 1894	40,819	......	192
1895	37,856	–2,963	169
1896	30,475	–7,380	151
1897	18,862	–11,614	128
1898	12,745	–6,117	94
1899	9,853	–2,892	71
1900	4,178	–5,675	52
1901	2,497	–1,681	45
1902	1,475	–1,022	27
1903	1,185	–290	27
1904	1,323	+138	28
1905	796	–527	26
1906	3,971	+3,176	34
1907	3,926	–45	29
1908	9,529	+5,603	52
1909	19,530	+1,001	44
1910	5,257	–5,273	39
1911	4,593	–664	39
1912	9,786	+5,193	44
1913	16,286	+6,500	49
1914	18,608	+2,322	68
1915	30,223	+11,615	85
1916	37,353	+7,130	94
Dec. 31, 1916	34,804	–2,550*	80
1917	17,376	–17,428	82
1918	19,208	+1,832	74
1919	16,590	–2,618	65
1920	16,290	–300	61
1921	13,512	–2,778	68
1922	15,259	+1,747	64
1923	12,623	–2,636	64
1924	8,105	–4,518	61
1925	18,687	+10,582	53
1926	17,632	–1,055	45
1927	16,752	–880	40
1928	5,256	–11,496	33
1929	5,703	+447	29
1930	9,486	+3,783	30
1931	12,970	+3,484	45
1932	22,545	+9,575	55
1933	41,698	+19,153	78
1934	42,168	+470	80
1935	68,345	+26,177	87
1936	69,712	+1,367	91
1937	70,884	+1,172	109
1938	76,938	+6,054	109
1939	77,103	+75	108
1940	75,270	–1,743	103
1941	69,859	–5,411	91
1942	66,904	–2,955	87
1943	64,758	–2,146	82
1944	51,939	–12,819	78

* Represents decrease for six months.

roads would appear to be insured against bankruptcy for a considerable period by ample safety cushions in working capital. While bankruptcies may be avoided, however, it is clear that our railroads will not be able to finance an important modernization program.

"Nevertheless, if earnings remain at an adequate level and investors have confidence that railroad earning power will not be attacked by the government, surprisingly rapid progress toward a satisfactory solution of credit conditions should result. . . .

"Common stock dividends are an absolute requisite if railroad credit is in fact to be restored, because sound credit conditions require financing from time to time by the sale of common stock, and common stock cannot be sold unless dividends satisfactory to investors are paid."

Rivals' Coerced Capital Blights R.R. Investing

From the foregoing testimony of leaders among investors themselves, it is evident that the substantial improvement which occurred during 1944 in the market prices of railroad stocks and bonds, and the steady strength of equipment trust obligations, do not argue any real correction of the carriers' fundamental problem which has been with them since the market collapse in 1929—namely, their inability to finance their reasonable requirements for the improvement and economizing of their service by the normal capitalistic method of selling new issues of securities to uncoerced investors in the private capital market. This dilemma is a serious one, and becomes more so the longer substantial modernization of railroad plant is postponed. It is aggravated from the standpoint of the railroads' competitive position by the fact that practically unlimited quantities of coerced investment (that is, taxpayers' money) are being poured into rival forms of transportation. Indeed, as some railroad spokesmen are beginning to suggest, the magnitude and unpredictability of these politically coerced "investments" in transport plant may be the principal reason why private investors are showing a degree of enthusiasm for railroad securities which is much cooler than railroad earnings would appear to warrant. A foresighted and thrifty individual does not pursue with zest a means of livelihood which is already overcrowded with accomplished amateurs who will perform for nothing.

Public Works Kill Off Private Works

And so the enormous job-making power of a program of railroad modernization, which would cost the taxpayers nothing, appears still to be checkmated by the insistence of those who control the opinions of the electorate that jobs be created artificially by means of taxes which strangle as many or more jobs in private industry as they give rise to in "public works."

Although investors' confidence in the railroads has not yet revived to a degree sufficient to provide the carriers with an adequate supply of new capital, their interest in railroad securities has risen considerably during the past year, as is perhaps best witnessed by the issuance by a number of stock exchange houses of rather elaborate brochures, analyzing the attractions of railroads as profitable investments. Among recent booklets of this character may be mentioned one entitled "Post-War Appraisal of Railroad Securities," issued by E. F. Hutton & Co., and another called "Railroads," published by the firm of Merrill, Lynch, Pierce, Fenner & Beane. Both these publications suggest the profit opportunities of selective

Summary of Railroad Receiverships and Trusteeships, 1876 to 1944

	Roads Placed in Receivership or Trusteeship		Roads Taken from Receivership or Trusteeship*			Roads Placed in Receivership or Trusteeship		Roads Taken from Receivership or Trusteeship*	
Year	No. of roads	Miles	No. of roads	Miles	Year	No. of roads	Miles	No. of roads	Miles
1876	42	6,662	30	3,840	1911	5	2,606	13	1,386
1877	38	3,637	54	3,875	1912	13	3,784	12	661
1878	27	2,320	48	3,906	1913	17	9,020	6	1,159
1879	12	1,102	65	4,909	1914	22	4,222	9	1,470
1880	13	885	31	3,775	1915	12	20,143	11	3,914
1881	5	110	29	2,617	1916	9	4,439	26	8,355
1882	12	912	16	867	1917	19	2,486	20	10,963
1883	11	1,990	18	1,354	1918	8	3,519	11	763
1884	37	11,038	15	710	1919	7	244	8	459
1885	44	8,836	22	3,156	1920	10	541	7	380
1886	13	1,799	45	7,687	1921	14	1,744	11	4,173
1887	9	1,046	31	5,478	1922	12	4,330	15	6,151
1888	22	3,270	19	1,596	1923	10	2,218	8	637
1889	22	3,803	25	2,930	1924	11	920	14	3,992
1890	26	2,963	29	3,825	1925	6	11,368	6	638
1891	26	2,159	21	3,223	1926	6	88	12	12,852
1892	36	10,508	28	1,922	1927	6	924	5	142
1893	74	20,340	25	1,613	1928	1	19	4	209
1894	38	7,025	42	5,643	1929	3	634	5	562
1895	31	4,089	52	12,831	1930	4	4,752	2	1,048
1896	34	5,441	58	13,730	1931	19	5,195	2	102
1897	18	1,537	42	6,675	1932	13	11,817	8	394
1898	18	2,069	47	6,054	1933	18	21,222	2	298
1899	10	1,019	32	4,294	1934	1	81	2	40
1900	16	1,165	24	3,477	1935	16	29,018	5	436
1901	4	73	17	1,139	1936	4	8	3	122
1902	5	278	20	693	1937	23	1,937	2	179
1903	9	229	13	555	1938	9	6,194	8	290
1904	8	744	13	524	1939	3	733	4	401
1905	10	3,593	6	679	1940	..	....	6	3,675
1906	6	204	8	262	1941	1	25	9	5,031
1907	7	317	6	114	1942	4	961	7	2,230
1908	24	8,009	3	138	1943	3	23	6	394
1909	5	859	12	2,629	1944	1	....	8	13,096
1910	7	735	17	1,100					

* Prior to 1938 these figures covered foreclosure sales only.

investments in railroad securities—but anyone who may be tempted to believe that a fundamental correction of the railroads' financial situation condition has occurred will find little encouragement in the conservatism with which these firms set forth probable railroad prospects.

A rather more optimistic view is taken by Patrick B. McGinnis of the firm of Pflugfelder, Bampton & Rust, a recent address by whom to the stock exchange's customers' brokers has been circulated by his firm. He estimated as of the time of his address (November 1) that the market price of all railroad securities was about $8 billions, covering a plant with a book value of $26½ billions and valued by the I. C. C. at about $20 billions. He gave his opinion that, at prices of the time he spoke, the market was considerably undervaluing the railroad industry; and developments since that time indicate that this condition may be on the way toward partial correction. Not even this sanguine observer, however, predicted the early ability of the carriers to raise large sums by the sale of common stocks, as would be necessary for the sound financing of a large program of fixed improvements.

Sales of Securities

Seven bankrupt railroads—including three major systems—completed their reorganization in 1944 (as tabulated elsewhere in this article) and were released from jurisdiction of the courts.

The sales of securities during 1944, aside from equipment issues, were exclusively for the purpose of meeting or anticipating maturities—or to replace higher-interest obligations with those bearing lower interest. The only major event of the year involving capital stock was the Louisville & Nashville's announcement of its intention, if the I. C. C. approves, to split its capital shares 2 to 1, reducing par from $100 to $50. Some of the leading refinancing bond sales during the year were the following:

In May the Burlington sold at par $30,000,000 of 3½ per cent collateral trust bonds and $10,000,000 of serial collateral trust notes, the latter being marketed at an interest cost of 1.7 per cent. With the proceeds of these issues, plus cash on hand, the company retired at 105 about $57,000,000 (face amount) of bonds maturing in 1949. This refinancing effected an annual interest saving of about $3,200,000, besides providing for an early maturity of some magnitude. In November the company sold an issues of $40,000,000 of first and refunding mortgage 3¾ per cent bonds, at 99.137, the proceeds being used to redeem an equivalent amount of 5 per cent bonds.

The Chicago Union Station marketed $37,800,000 of first mortgage bonds and $6,200,000 of serial notes in August—the former at an interest cost of 2.83 per cent and the latter at 1.83 per cent—the proceeds being used to redeem at 108 an issue of 3¾ per cent bonds.

The Erie in September sold $13,000,000 of first consolidated mortgage bonds at an interest cost of 3.31 per cent, the proceeds being used to redeem $13,385,000 of 3¾ per cent bonds.

The Great Northern in September sold $35,000,000 of 3⅛ per cent general mortgage bonds due 1960 at 100.88; $30,000,000 of 3⅜ per cent bonds due 1970 at 100.18; and $35,000,000 of 3½ per cent bonds due 1980 at 100.81—the proceeds being used, with treasury cash, to redeem $119,887,700 of outstanding bonds, about two-thirds of which had relatively early maturity dates and all of which bore interest at higher rates than the new issues.

The Gulf, Mobile & Ohio in September sold $10,500,000 of first and refunding bonds at an interest cost of 3.93 per cent, the proceeds being used with treasury cash to redeem $10,600,000 of outstanding issues maturing during the 1950's the bulk of which bore higher interest rates.

The Kansas City Terminal in August sold an issue of $47,000,000 of serial first mortgage bonds at an interest cost of 2.7474 per cent, the proceeds being used with other funds to retire $49,121,000 of outstanding 4 per cent bonds.

The Louisville & Nashville in September called for redemption on January 1, 1945, an issue of $10,997,000 of unified mortgage 3½ per cent bonds, maturing serially until 1950. In December this company applied to the I. C. C. for authority to issue $53,835,000 of 3⅜ first and refunding mortgage bonds, the proceeds to be used to retire issues bearing higher interest rates.

The Maine Central in November sold $9,000,000 of 4 per cent bonds at 98½, due in 1954, using the proceeds, with other funds, to redeem an issue of 4 per cent bonds due in 1945.

The Nickel Plate in November sold $10,000,000 of serial promissory notes at an interest cost of 1.745 per cent, using the proceeds, with treasury cash, to pay off $15,188,000 of extended first 3½ per cent bonds due 1947. In December the company sold $42,000,000 of refunding mortgage bonds at an interest cost of 3.73 per cent, the proceeds to be used to pay off $26,058,000 of 5½ per cent bonds, $6,500,000 of 4 per cent Clover Leaf bonds and the $10,000,000 collateral notes previously arranged for.

The Pennsylvania's subsidiary, the Pennsylvania Company, in May sold $35,000,000 of secured notes at an average interest cost of 2.915 per cent in connection with the redemption of $44,779,000 of 4 per cent notes in the hands of the public. In October the P. C. C. & St. L. sold $23,735,000 of 3⅜ per cent bonds at 101.0201, and the Cleveland & Pittsburgh sold $11,000,000 of 3 per cent general and refunding mortgage bonds at 100.45. The Pennsylvania in December announced its intention to sell $60,000,000 of general mortgage bonds with interest rate to be determined by competitive bidding, the proceeds to be used to retire a like amount of outstanding 4½ per cent debenture bonds.

The Southern Pacific's subsidiary, the Central Pacific, in October authorized the issuance of $50,000,000 of 4¼ per cent first and refunding mortgage bonds (interest declining to 3½ per cent after 1949) to be offered par-for-par to holders of $88,211,000 of outstanding 4 per cent bonds, due 1949. The company has redeemed a number of smaller bond issues during the year and has reduced its indebtedness by $190,000,000 since 1940, exclusive of equipment obligations.

The Texas Pacific-Missouri Pacific Terminal in June sold $6,040,000 of 3⅜ per cent bonds at 100.879, the proceeds being used to redeem a like principal amount of 5½ per cent bonds.

The Oregon-Washington in September sold $54,750,000 of 3 per cent refunding mortgage bonds (guaranteed by the Union Pacific) at 102.098, the proceeds being used to redeem outstanding 4 per cent bonds.

The Cincinnati Union Terminal in August sold $24,000,000 of 2¾ per cent bonds at 101.08, the proceeds being used to redeem an equal principal amount of 3½ per cent bonds.

Noteworthy Dividend Changes

The Akron, Canton & Youngstown paid off $10 in arrears on its 5 per cent preferred stock in 1944.

The Atlanta & West Point declared a $2.50 dividend on common stock in December; previous dividend of $3.00 in December, 1943.

The Atlantic Coast Line paid $3.50 in dividends on capital stock in 1944 compared with $3 disbursed in 1943.

The Bangor & Aroostook paid $8.75 of arrears on its 5 per cent preferred stock.

The Canadian Pacific after having paid 50 cents on its ordinary stock in February, withheld a further payment in August, in the light of a wage increase award.

The Chicago & Eastern Illinois directors took no action on a December, 1944, dividend on common stock, stating that dividend action was deferred because of a program under consideration for the rehabilitation of equipment. A 50-cent dividend was paid in December, 1943.

The Chicago & North Western paid an initial $15 on its 5 per cent preferred stock in September, representing dividends due for 1941, 1942 and 1943, and declared an additional $5 on that stock in November. This company also declared an initial $5 on common stock in November.

The Chicago Great Western made payments aggregating $2.50 in arrears on its 5 per cent preference stock in 1944, compared with $3.75 in 1943.

The Green Bay & Western declared an irregular dividend of $15 on Class B debentures in 1944. In February, 1943, a dividend payment of $10 was made on this stock.

The Maine Central paid $7.50 on arrears of its 6 per cent preferred stock thereby clearing up its arrearages.

The Minneapolis & St. Louis declared an initial $2 on capital stock in May.

The Nashville, Chattanooga & St. Louis paid $2 on common stock in 1944, compared with $3 in 1943.

The Norfolk & Southern declared $1 on common stock in November as compared with an initial $2 on this stock paid in 1943.

The Southern paid $2.75 on common in 1944 compared with $2 paid on this stock in 1943.

The Southern Pacific paid $2.30 (including 25 cents extra in June) on its common stock in 1944 compared with a payment of $2 on this stock in 1943.

Tennessee Central cleared up its arrearages to July 2, 1944, by paying $21 on its 7 per cent converging preferred stock.

The Western Maryland reduced arrearages on its 7 per cent preference stock by $7 in November.

The Wheeling & Lake Erie made dividend payments aggregating $2.25 in 1944, compared with total dividends of $4.50 in 1943.

1944 BUYING up quarter billion

Total purchases of $1,891,880,000 were 15 per cent greater than for 1943, also the largest since 1929

By *C. MILES BURPEE*
Purchasing and Stores Department Editor

Purchases of Equipment, Materials and Fuel
By All Class I Railroads in 1943 and 1944

	1944* (000)	1943 (000)	Increase Per Cent
Equipment**	$255,000	$248,000	3
Rail	73,779	60,074	23
Crossties	91,065	83,402	9
All Other Material	882,710	723,509	22
Total from Manufacturers	$1,302,554	$1,114,985	17
Fuel	589,326	527,296	12
Grand Total	$1,891,880	$1,642,281	15

* Preliminary estimates by Railway Age.
** Equipment figures are for amount *delivered* in 1943 and for amount *ordered* in 1944.
Total railway purchases of all durable goods from manufacturers charged to both capital and operation were larger in both years than the figures given in the table.

Class I railroad purchases of materials, supplies, equipment and fuel in 1944, totalled $1,891,880,000, an increase of $249,599,000 or approximately 15 per cent compared with 1943, and greater than for any comparable period since 1929, according to preliminary estimates prepared by *Railway Age* and based upon regular monthly reports of a large majority of the roads involved. The 1944 total includes $1,047,554,000 of materials and supplies received from manufacturers, $255,000,000 of locomotives and cars ordered from manufacturers and $589,326,000 of fuel. It is significant that while total 1944 purchases (including fuel and equipment) increased 15 per cent compared to 1943, the value of materials and supplies received from manufacturers increased 22 per cent, the value of orders placed with manufacturers for rolling stocks increased 3 per cent and the value of fuel purchased increased approximately 12 per cent compared to the preceding year.

Miscellaneous Expenditures

The $1,047,554,000 spent by Class I roads last year for materials and supplies of all kinds, with the exception of fuel, was 20 per cent greater than the amount spent for these products in the preceding year, 26 per cent more than in 1942, 29 per cent more than in 1941, 80 per cent greater than in 1940, 5 per cent greater than expenditures for similar materials and supplies in 1929 and greater than for any year since that time.

The expenditures for miscellaneous materials and supplies last year (excluding rail, crossties and fuel) amounted to approximately $882,710,000 which exceeded similar purchases in 1943 by 21 per cent, those of 1942 by 23 per cent and surpassed the 1929 amount by 16 per cent and topped similar purchases for every year in the interim.

Of the $255,000,000 of new equipment ordered from manufacturers during 1944, approximately $120,000,000 was for new freight cars, $30,000,000 was for new passenger-train cars and $105,000,000 was for new locomotives. By reason of governmental control, allocation procedures and the lack of comparable order records for 1941, 1942 and 1943, it is difficult to draw comparisons; however, the railways installed approximately $248,000,000 of locomotives and freight cars in 1943, and in addition approximately $21,000,000 of equipment built in railway shops (the value of the materials for which is included in the figures of material purchases for that period), or a total of $269,000,000 for new equipment in 1943, compared to $325,000,000 for 1942 and $393,000,000 for 1941.

Substantial Increases

Expenditures for rail amounted to $73,779,000 or 23 per cent more than in 1943, 32 per cent more than for 1942, 41 per cent greater than for 1941 and equivalent to approximately 83 per cent of the amount spent for rail in 1929. The price for rail, without extras, has remained unchanged since 1939, and is approximately seven per cent less than in 1929.

Railways spent approximately $91,065,000 for crossties in 1944, nine per cent more than in 1943, approximately 45 per cent more than in 1942, 82 per cent more than in 1941 and more than for any year since 1930.

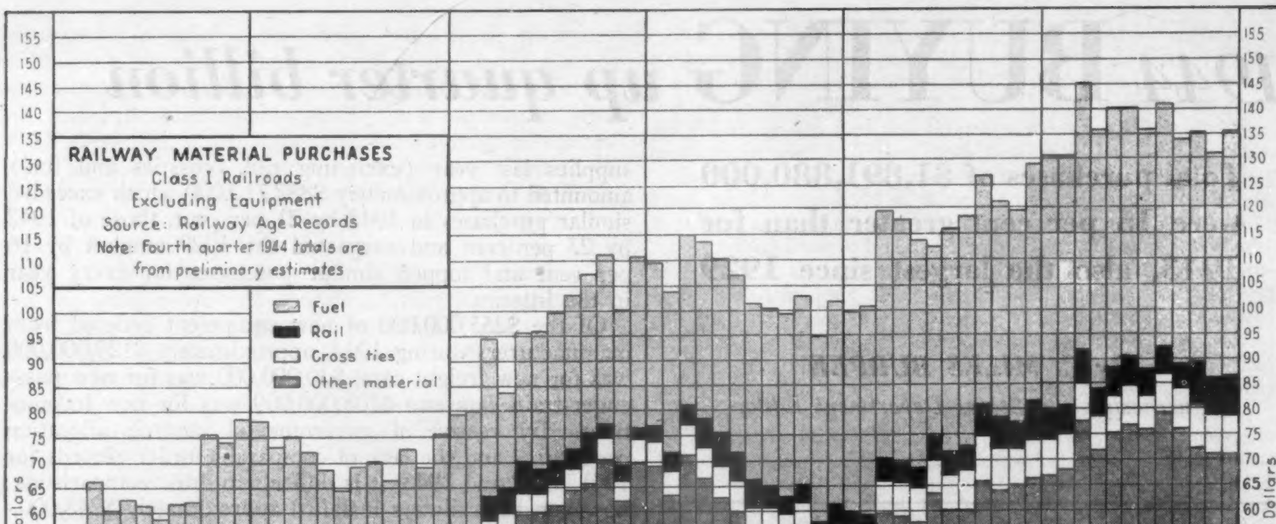
Although for the most part the prices paid for iron and steel products remained stable during the year, many other materials and supplies have shown substantial increases. These advances have been particularly sharp in the case of forest products since the outbreak of war in 1939. These factors and others, such as substitutions for critical materials and the revision of standard material specifications, must be considered when any interpretation of these figures and unit volumes are concerned.

Purchases of coal and petroleum fuel products established a new peak last year when Class I roads spent $589,326,000 for these products. This amount

Annual Purchases of Materials and Supplies
Class I Railroads
(*Equipment Excluded*)

	Fuel (000)	Rail (000)	Cross Ties (000)	Other Material (000)	Total (000)	Total Less Fuel (000)
1929	$336,805	$88,735	$143,874	$759,186	$1,328,600	$991,795
1930	308,277	60,980	127,652	538,591	1,035,500	727,223
1931	244,500	41,500	44,000	365,000	695,000	450,500
1932	178,250	15,500	27,550	223,700	445,000	266,750
1933	179,150	10,650	19,750	248,200	457,750	278,600
1934	220,000	33,200	39,700	332,100	625,000	405,000
1935	232,400	20,354	33,780	306,593	593,127	360,727
1936	271,398	37,237	41,360	452,309	802,304	530,906
1937	293,540	44,935	58,361	562,100	958,936	665,396
1938	243,889	23,920	37,911	277,091	582,811	338,922
1939	257,880	38,340	39,760	434,394	770,374	512,494
1940	273,677	45,418	47,995	488,883	855,973	582,296
1941	349,848	52,311	50,039	710,831	1,163,029	813,181
1942	426,335	55,647	63,153	714,676	1,259,811	833,476
1943	527,296	60,074	83,402	723,509	1,394,281	866,985
1944*	589,326	73,779	91,065	882,710	1,636,880	1,047,554

* Preliminary Estimates.



Monthly Purchases of Materials and Supplies 1940-1944 Class I Railroads

Miscellaneous Materials and Supplies—In Thousands

	1944*	1943	1942	1941	1940
Jan.	$67,079	$51,147	$69,060	$45,457	$45,593
Feb.	67,773	50,531	63,216	43,467	39,939
Mar.	77,470	59,381	71,172	54,070	42,655
Apr.	71,468	58,806	66,479	55,444	39,407
May	75,632	57,513	62,880	59,492	37,122
June	76,589	63,240	59,889	59,682	34,510
July	75,990	60,173	54,940	61,117	39,447
Aug.	79,187	60,192	54,932	64,372	42,016
Sept.	76,976	66,270	54,156	65,715	40,777
Oct.	72,418	64,701	56,759	70,250	43,630
Nov.	71,068	65,106	49,464	62,057	39,620
Dec.	71,060	66,449	52,579	69,709	44,169
	$882,710	$723,509	$715,526	$710,832	$488,885

Rail—In Thousands

	1944*	1943	1942	1941	1940
Jan.	$5,613	$4,471	$3,075	$3,464	$3,529
Feb.	5,474	4,033	3,817	5,297	4,815
Mar.	6,729	4,385	3,770	5,168	6,042
Apr.	5,396	3,886	5,831	4,857	6,470
May	5,408	4,274	6,641	6,196	5,019
June	5,687	4,260	5,833	4,868	5,022
July	4,891	4,726	5,573	4,697	4,570
Aug.	5,556	4,785	4,624	3,879	2,325
Sept.	4,829	5,916	3,626	5,511	1,855
Oct.	8,504	6,016	3,771	2,964	2,574
Nov.	7,532	5,668	4,265	3,189	2,094
Dec.	8,160	7,654	4,877	2,219	1,100
	$73,779	$60,074	$55,703	$52,309	$45,415

Cross Ties—In Thousands

	1944*	1943	1942	1941	1940
Jan.	$7,048	$4,118	$4,895	$3,472	$4,128
Feb.	6,823	4,622	4,837	3,514	3,928
Mar.	7,533	6,612	6,130	4,087	4,635
Apr.	6,895	6,758	6,173	4,365	4,585
May	7,574	6,894	6,186	4,369	4,789
June	7,757	6,964	6,168	4,071	4,645
July	7,641	7,422	5,710	4,192	4,293
Aug.	7,699	8,040	5,637	4,345	3,898
Sept.	7,781	8,934	5,152	4,396	3,382
Oct.	8,634	8,188	4,647	4,398	3,487
Nov.	7,860	7,262	4,093	4,116	3,116
Dec.	7,820	7,588	3,831	4,715	3,110
	$91,065	$83,402	$63,459	$50,040	$47,996

Total Materials (Less Fuel)—In Thousands

	1944*	1943	1942	1941	1940
Jan.	$79,740	$59,736	$77,030	$52,393	$53,250
Feb.	80,070	59,186	71,870	52,278	48,682
Mar.	91,732	70,378	81,072	63,325	53,332
Apr.	83,759	69,450	78,483	64,666	50,462
May	88,614	68,681	75,707	70,057	46,930
June	90,033	74,464	71,890	68,621	44,177
July	88,522	72,231	66,223	70,006	48,310
Aug.	92,442	73,017	65,193	72,596	48,239
Sept.	89,586	81,120	62,934	75,622	46,014
Oct.	89,556	78,905	65,177	77,612	49,691
Nov.	86,460	78,036	57,822	69,362	44,830
Dec.	87,040	81,691	61,287	76,643	48,379
	$1,047,554	$866,985	$834,688	$813,181	$582,296

Fuel—In Thousands

	1944*	1943	1942	1941	1940
Jan.	$50,844	$39,882	$32,803	$27,261	$24,977
Feb.	50,541	41,542	31,945	27,901	24,219
Mar.	53,809	49,296	33,976	31,121	21,880
Apr.	52,171	48,368	35,179	19,203	21,575
May	51,549	44,990	34,651	25,550	21,852
June	50,202	38,018	35,239	27,338	20,160
July	47,857	43,696	35,101	29,700	20,875
Aug.	48,433	45,404	35,417	30,535	22,128
Sept.	44,418	45,703	36,265	31,605	21,575
Oct.	46,002	42,406	37,729	34,343	23,104
Nov.	44,540	40,992	37,067	31,062	24,145
Dec.	48,960	47,000	40,340	34,229	27,187
	$589,326	$527,296	$425,712	$349,848	$273,677

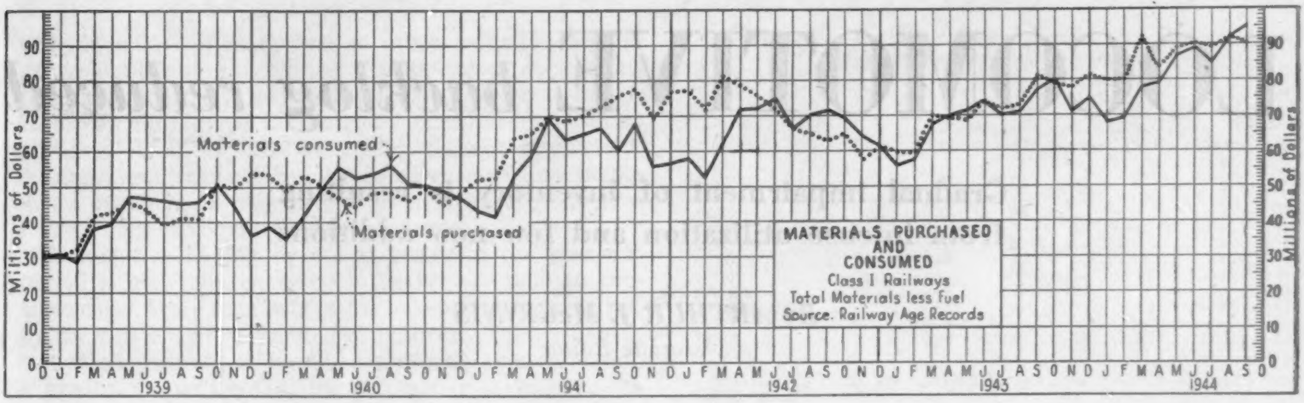
Total Material and Fuel—In Thousands

	1944*	1943	1942	1941	1940
Jan.	$130,584	$99,618	$109,833	$79,654	$78,227
Feb.	130,611	100,728	103,815	80,179	72,901
Mar.	145,541	119,674	115,048	94,446	75,212
Apr.	135,930	117,818	113,662	83,869	72,037
May	140,163	113,671	110,358	95,607	68,782
June	140,235	112,482	107,129	95,959	64,337
July	136,379	116,017	101,324	99,706	69,185
Aug.	140,875	118,421	100,610	103,131	70,367
Sept.	134,004	126,823	99,199	107,227	67,589
Oct.	135,558	121,311	102,906	111,955	72,795
Nov.	131,000	119,028	94,889	100,424	68,975
Dec.	136,000	128,691	101,627	110,872	75,566
	$1,636,880	$1,394,281	$1,260,400	$1,163,029	$855,973

* Subject to revision.

was nearly 12 per cent greater than 1943 expenditures for this purpose, 38 per cent more than in 1942, 68 per cent more than in 1941 and 74 per cent more than in 1929.

The month of July, 1943, marked a turning point in the relationship of materials and supplies (excepting fuel) purchased and those consumed. Since that time the value of materials and supplies purchased has con-



Fuel, Materials and Supplies in Stock
Class I Railroads

	Fuel (000)	Rail—New and S. H. (000)	Cross Ties (000)	Stores Stock (000)	Scrap (000)	Total (000)
			Year 1943			
Jan. 1	$47,612	$18,131	$52,977	$375,376	$ 9,805	$503,901
Feb. 1	43,654	19,583	56,587	374,097	10,408	504,329
Mar. 1	45,374	20,651	58,999	371,835	10,385	507,244
Apr. 1	50,330	20,753	62,280	371,332	10,517	515,212
May 1	55,627	19,206	61,016	373,565	10,105	519,519
June 1	58,172	19,424	60,479	370,995	10,167	519,237
July 1	55,595	20,811	56,863	373,205	10,267	516,741
Aug. 1	58,216	19,035	57,536	376,295	9,258	520,340
Sept. 1	61,204	19,558	59,185	376,180	8,607	524,734
Oct. 1	61,925	19,764	61,665	378,022	8,170	529,546
Nov. 1	58,769	19,067	62,809	376,825	11,392	428,862
Dec. 1	52,007	21,631	64,368	379,962	8,284	526,252
			Year 1944*			
Jan. 1	50,221	22,342	67,964	382,566	9,628	532,721
Feb. 1	49,056	24,331	72,039	387,899	9,937	543,262
Mar. 1	49,749	25,199	76,254	393,892	9,925	555,019
Apr. 1	49,938	26,923	81,525	400,722	10,334	569,442
May 1	51,320	23,081	80,463	410,114	10,319	575,297
June 1	56,885	22,637	79,004	413,410	10,346	582,282
July 1	62,558	22,729	75,244	418,408	9,683	588,622
Aug. 1	64,515	23,190	75,004	422,002	9,682	594,393
Sept. 1	67,538	22,324	71,306	427,277	10,292	598,737
Oct. 1	66,508	22,087	70,439	433,181	10,016	602,231

* Subject to revision.

sistently exceeded the amounts consumed and this relationship held true through every month of 1944. Inventories of these items increased consistently from $465,961,000 on December 1, 1943, to $525,707,000 on October 1, 1944, the latest information available at this writing. This does not represent a corresponding increase in material quantities, for while the prices of many materials have remained set by governmental control, appreciable increases have occurred in the cost of many items. For instance in recent testimony before the Interstate Commerce Commission, Dr. Julius H. Parmelee, director, Bureau of Railway Economics, said that advances have occurred up to 29 per cent of the 1940 prices that railways paid for materials.

Railway Operations

(*Continued from page 81*)

cent below 1929; net railway operating income was 998 million dollars, 20 per cent below 1929. If the estimates referred to prove accurate, if traffic in the pastwar years is no greater than in 1941, and if operating costs continue, as now, to be higher than in 1941, net earnings will be considerably less than in 1941, and very much less than in 1929. This is the prospect, as it develops out of a number of studies recently completed.

The railroad industry is studying this same question, through the medium of its Railroad Committee for the Study of Transportation. That committee expects in 1945 to complete its report on economic and rail prospects after the war, a report to which much work and study have already been devoted. The endeavor will be to chart the future by means of a review of past trends in production, employment, trade and transportation. Whether or not this report will support some of the estimates already published, or will prove to be somewhat more liberal in its appraisal of the future, remains yet to be determined.

What lies immediately ahead of the railroads in 1945 is their war transportation job, intensified in some respects, successful accomplishment of which is just as vital to the war effort as it has been on each and every day since Pearl Harbor. Railroad managements dedicated themselves in 1940 to carrying out their pledge to continue to meet to the full the demands of commerce and the needs of national defense. That pledge has been faithfully kept; it will continue to be kept, with the intelligent cooperation of the government and of shippers, until peace again descends on the world.

* * *

British Combine Photo

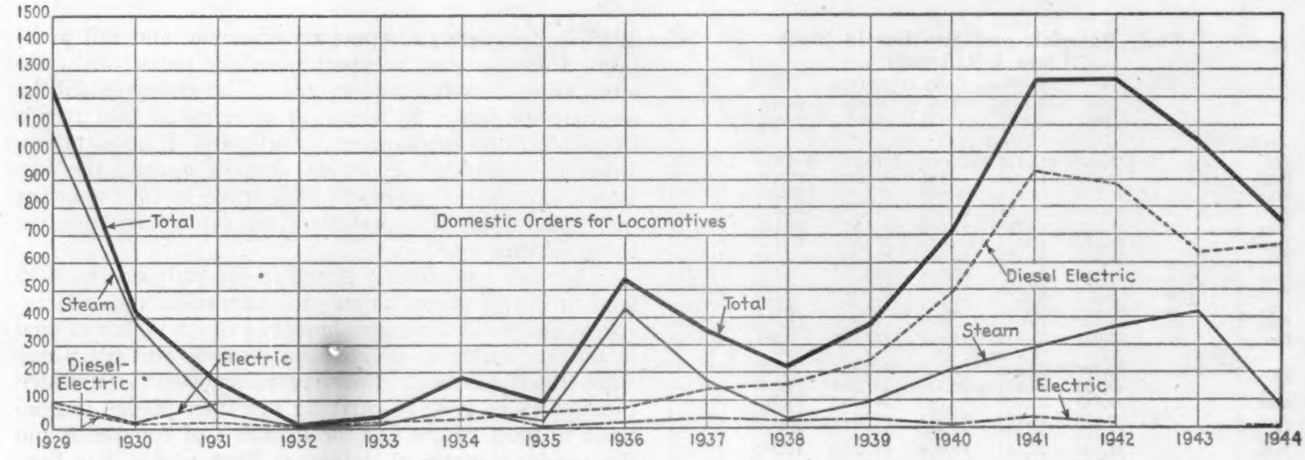
Switching in Railway Yard at Ballarat, Victoria, Australia

Major Point on the Trans-Australian Rail Route, Through Which Passes Produce of the Rich Western and Northwestern Districts of Victoria on its Way to Metropolitan Markets.

LOCOMOTIVE *backlog reduced*

Gradual impairment of inventory is resulting from intense utilization and few new additions

By ARTHUR J. McGINNIS
Associate Editor



AS reported to the *Railway Age,* there were 74 steam locomotives ordered during 1944 for domestic service by ten railroads and 596 Diesel-electric locomotives reported ordered by 60 railroads. In addition, 74 Diesel and three electric locomotives were purchased by 46 industrial companies and private car lines.

25 Are 4-6-4-4's

Forty-nine of the steam locomotives were ordered from contract builders. The Pennsylvania ordered the remaining 25, of 4-6-4-4 wheel arrangement, from its own shops in March, cancelling 25 of the forty 2-10-4 type engines ordered from its shops in June, 1943. Sixty-two of the steam locomotives were classified for freight service, eleven for freight and passenger service and one for passenger service. Of the 74 ordered, sixteen were reported delivered during the year.

Railroad Diesel locomotives ordered were classified 199 for road service, and 397 for switching service. About 146 of the 596 ordered by railroads were delivered during the year and 22 of the 74 ordered by industrial companies.

American builders also received orders during the year for 95 steam, 27 Diesel and 12 electric locomotives for export to Mexico, the West Indies, South America, Portugal and Portuguese East Africa—the largest volume of foreign orders placed here for export since 1926.

Locomotives reported delivered during the year, exclusive of engines built for the government and for lend-lease, totaled 1,249 units, of which 1,171 were for domestic service and 78 for export. Domestic deliveries included 320 steam engines, 291 by contract builders and 29 by railroad shops, 847 Diesel and four electric locomotives. The 78 built here for export comprised 21 steam, 43 Diesel and 14 electric locomotives.

Canadian builders received orders for 324 locomotives during the year, 32 for service in Canada and 292 for export to the Indian State Railways, and reported production of 189 engines, 77 for local service and 112 for export.

Locomotives ordered in 1944 are listed in detail in the appended table and an analysis and comparison of these orders and the year's production is presented in Tables I, II and III herein. The *Railway Age* is not permitted to publish, at this time, the number of locomotives ordered or built for U. S. Government departments, either for domestic service or for export, and these accordingly are omitted.

Backlog Less Than 500

Because of the early publication date of this summary of orders and deliveries, the latest available figures permitting an estimate of the backlog of locomotives on order are as of December 1, 1944. On that date, the Association of American Railroads reported that Class I railroads had 495 new locomotives on order, less than half the 1,004 on order on December 1, 1943. There were only 90 steam locomotives undelivered, as compared with more than four times that many, or 387, a year ago and 403 Diesel and two electric on order as compared with 614 and three last year.

Locomotive builders represented by the Industry Advisory Committee of the War Production Board have informed the board that current production of locomotives is below the industry's capacity and that orders for new locomotives must be placed immediately if full advantage is to be taken of available manufacturing space. Present W. P. B. production schedules for large locomotives (that is, over 100 tons) are projected only through the second quarter of 1945 and the danger in such a situation

is both in loss of manpower to other industries and in delays in obtaining deliveries of components, such as injectors, superheaters and feed water pumps, whose manufacturers must know the builders' requirements well in advance. With capacity exceeding current production, military requirements can be taken care of and precedence over non-military orders given to such production if later needs exceed advance schedules.

Locomotive buying by the railroads in the post-war period is generally expected to be heavier than in pre-war years. More than half of the locomotives now owned by the carriers are estimated to be over 25 years old, as compared with about one-third a decade ago, indicating a gradual impairment of the locomotive inventory. As much as 70 per cent or more is figured to be 20 years or over. Intense utilization in moving an immense volume of war traffic is exhausting the service life of this older power. Freight and passenger locomotives are being worn out at an unprecedented rate and many units are scheduled to be scrapped as soon as the present emergency is passed.

Table I—Locomotives Ordered, 1929-1944

Year	Domestic					
	Steam	Diesel	Electric	Total	U. S. Export	Canadian (Inc. Export)
1944	74	670	3	747	134	324
1943	413	635	..	1,048	60	241
1942	363	894	12	1,269	32	53
1941	293	937	38	1,268	85	79
1940	207	492	13	712	85	3
1939	119	249	32	400	40	56
1938	36	160	29	225	24	35
1937	173	145	36	354	56	57
1936	435	77	24	536	22	1
1935	30	60	7	97	15	27
1934	72	37	76	185	17	..
1933	17	25	..	42	7	..
1932	5	7	..	12	1	1
1931	62	21	91	174	28	2
1930	382	18	21	421	20	95
1929	1,055	80	95	1,230	106	77

Note:—The totals of domestic and U. S. export orders for years 1941-1944, exclude U. S. Government purchases. Domestic orders placed in 1941-1943 are adjusted to eliminate orders subsequently cancelled due to W.P.B. restrictions on building. In certain instances, domestic orders placed in December are not reported until following year; statistics for years 1929-1943 are adjusted to eliminate this overlap.

Estimates of the number of locomotives to be purchased in the immediate post-war years range from 1,300 to 1,700 annually, of all types—steam, Diesel, and electric.

Orders in Prospect

Orders for road locomotives, for passenger and freight service, are expected to increase materially, perhaps to 1,000 or more annually, in contrast to pre-war years, when orders for switching power predominated. The accumulation of old age, deferred maintenance and, to some extent, obsolescence favor large scale buying after the war. The strong cash position with which the railroads will end the war make such buying feasible and the anticipated high level of national production and railroad traffic make it advisable. Post-war competition also will cause the railroads to seek the greater efficiency and economy obtainable with new locomotives.

In addition to an expanded domestic railroad market for locomotives, a huge foreign market to speed the rehabilitation of Europe and replace equipment destroyed during the war will be open to American equipment builders. Resumption of industrial activity in France depends on the restoration of the country's transportation system, for which about 2,000 locomotives are said to be needed. Already a French supply commission is seeking to place orders here for 700 locomotives of 2-8-2 wheel arrangement, after originally inquiring for 1,300 units of 2-8-2 and 2-10-0 wheel arrangement. China, planning to build thousands of miles of new railroads as part of a long range program for the economic development of that country, may look to the United States for locomotives, and Latin America, for which a post-war period of rapid industrialization is foreseen, will provide another large potential market.

Table II—Domestic Diesel Locomotive Orders by Horsepower and Purchaser

Horsepower	Railroads 1944	Railroads 1943	Industrial Cos. and Private Car Lines 1944	Industrial Cos. and Private Car Lines 1943	Total 1944	Total 1943
6,000	6	3	..	..	6	3
5,400	39	70	..	..	39	70
4,050	8	..	..	..	8	..
4,000	22	38	..	..	22	38
2,700	8	..	..	..	8	..
2,000	78	22	..	..	78	22
1,350	18	..	..	..	18	..
1,000	334	342	..	11	334	353
660-600	57	31	23	6	80	37
Less than 600	26	30	51	82	77	112
Total	596	536	74	99	670	635

Note:—1943 totals are adjusted to eliminate orders subsequently cancelled in 1944.

Complications in Getting Complete Data

The appended list of orders was compiled from information furnished to the *Railway Age* by railroads, private car lines, and other purchasers of locomotives in response to requests for this information. Data thus compiled were then checked against lists of orders supplied by locomotive builders. In some instances, particularly in respect of Diesel-electric locomotive orders placed by industrial firms with the General Electric Company and other builders serving this market, because of the early publication date of this compilation, certain orders placed in December may be omitted.

Compilation of a detailed list of orders, particularly for Diesel locomotives, was again complicated by the unusual conditions resulting from government control over the production and distribution of motive power. Diesel locomotives are built for stock, not on specific orders from customers, and blanket authorizations covering a number of locomotives granted to builders. During the year, plants of the American Locomotive Company and Baldwin Locomotive Works generally were restricted to the building of Diesel locomotives of 600 or 1,000 hp. and the Electro-Motive division of the General Motors Corporation to the building of Diesel freight engines of 5,400

Table III—Locomotives Built, 1929-1944

Year	Domestic	U. S. Export	Total U. S.	Canadian
1944	1,171	78	1,249	189
1943	1,012	58	1,070	94
1942	936	11	947	71
1941	1,047	57	1,104	3
1940	435	66	501	59
1939	338	16	354	1
1938	272	28	300	46
1937	526	44	570	45
1936	157	22	179	23
1935	184	17	201	4
1934	91	19	110	..
1933	57	6	63	..
1932	102	18	120	3
1931	181	17	198	24
1930	972	51	1,023	111
1929	926	139	1,065	96

Note:—Domestic and U. S. export totals for 1942-1944 exclude locomotives built for the U. S. Government and lend-lease.

hp. There were no Diesel passenger locomotives delivered during 1944, although some were authorized and are scheduled for delivery early in 1945.

W. P. B. Procedure

Toward the close of each month, the War Production Board, transportation section, issues a directive to the builders respecting deliveries of the 600 and 1,000 hp. engines for the succeeding month. Directives covering deliveries of the freight locomotives are made further in advance, about four times a year. Allocations are based chiefly on the recommendations of the Office of Defense Transportation, claimant agency for transportation under the W. P. B.'s controlled materials plan, as to deliveries of locomotives under production.

Diesel locomotives of 600 and 1,000 hp. ordered from one builder may be released for delivery from the stock of the other and duplicate orders thus reported to the *Railway Age*. Nor are O. D. T. allocations of Diesel power necessarily made according to seniority of order. Effort has been made, within the time available, to eliminate duplications from the appended list and, for comparative purposes, to adjust previous years' totals for all subsequent cancellations reported. The date of delivery has been shown in the tables for locomotives ordered and delivered during the year, and the scheduled 1945 delivery date of steam locomotives ordered but undelivered at the year end, but, to avoid errors, tentative future delivery schedules for Diesel locomotives have been omitted.

The *Railway Age* cannot guarantee the statistical accuracy or completeness of the list or totals drawn therefrom, but it is believed that the information is reliable and that such omissions or revisions as later occur will be relatively small and unimportant in a general comparison of the figures with preceding years.

Steam Locomotives Ordered in 1944

For Service in the United States

Purchaser	No.	Type	Service	Weight	Tractive force	Cylinders	Date of Order	Date of Delivery	Builder
Alaska	1	4-6-2	Passenger	248,980	36,500	22 x 28	June	May '45	Baldwin
Akron, Canton & Youngstown	1	2-8-2	Freight	327,300	53,800	26 x 30	February	October	Lima
Baltimore & Ohio	10	2-8-8-4	Freight	646,000	115,000	24 x 32 (4 cyl.)	July	May-Aug. '45	Baldwin
Bangor & Aroostook	1	4-8-2	Freight	319,000	60,200	22½ x 30	April	1945	American
	1	2-8-0	Freight	239,000	45,200	22¼ x 30	April	1945	American
Chesapeake & Ohio	15	2-6-6-6	Freight	724,500	110,200	22½ x 33 (4 cyl.)	February	December	Lima
New York Central	1	4-8-4	Pass. & Frt.	465,000	62,500	25 x 32	April	Mar. '45	American
	50	Tender	......	......	......	......	January	......	Lima
Pennsylvania	25	4-4-6-4	Freight	623,100	114,860	19¾ x 28 23¾ x 29	March	Apr. '45	Company Shops
	1‡	4-4-6-4	Freight	623,100	114,860	19¾ x 28 23¾ x 29	Dec. '43	August	Company Shops
Richmond, Fredericksburg & Potomac	10	4-8-4	Pass. & Frt.	419,000	62,800	27 x 30	March	Feb. '45	Baldwin
Virginian	8	2-6-6-6	Freight	750,000	110,200	22½ x 33 (4 cyl.)	May	Mar. '45	Lima
Western Maryland	1	Shay	Freight	313,000	59,740	17 x 18 (3 cyl.)	May	......	Lima

‡ 1943 totals have been adjusted to include this locomotive which was not reported last year.

United States—Export

Purchaser	No.	Type	Service	Weight	Tractive force	Cylinders	Date of Order	Date of Delivery	Builder
Portuguese Government Railways, Mozambique	3	2-10-2	Freight	180,000	33,400	21½ x 24	June	......	Baldwin
Central Northern, Colombia	6	4-8-2	Freight	184,500	30,500	18½ x 22	October	......	Baldwin
Portuguese Railways	22	2-8-2	Freight	198,000	......	21 x 28	August	1945	American
Consolidated Railroads of Cuba	10	2-8-2	Freight	231,000	......	22 x 28	August	1945	American
F. C. De Antioquia (Colombia)	4	2-8-2	Freight	138,000	26,400	17 x 22	October	......	Baldwin
F.F.C.C. Unidos De Yucatan (Mexico)	2	4-4-0	Freight	63,000	9,000	13 x 18	September	*	Baldwin
Guayaquil & Quito, Ecuador	1	2-8-0	Freight	145,000	32,150	19 x 22	February	......	Baldwin
Jamaica Government Railway	3	2-8-0	Freight	161,000	......	19 x 26	November	1945	American
Leopoldina Railway, Brazil	8	2-8-2	Freight	137,500	29,200	19 x 20	May	......	Baldwin
Brazilian Ministry of Transport and Public Works	10	2-6-6-2	Freight	161,000	30,700	14 x 22 (4 cyl)	October	......	Baldwin
	7	4-8-4	Freight	212,000	30,700	18 x 28	October	*	Baldwin
	9	2-8-2	Freight	181,000	36,300	18½ x 22	October	......	Baldwin
Parana-Santa Catharina Railway, Brazil	2	4-8-2	Freight	162,000	......	20 x 22	November	1945	American
	4	4-8-2	Freight	162,000	......	20 x 22	February	1945	American
	4	4-8-2	Freight	177,000	30,500	19 x 22	September	......	Baldwin

* Locomotives reported not authorized for building by War Production Board.

Canada—Including Export

Purchaser	No.	Type	Service	Weight	Tractive force	Cylinders	Date of Order	Date of Delivery	Builder
Canadian Pacific	30	4-6-2	Passenger	231,000	34,000	20 x 28	October	1945	Montreal
Pacific Great Eastern	2	2-8-2	Freight	227,000	38,400	20 x 30	November	May '45	Canadian
Indian State Railways	75	2-8-2	Freight	198,000	35,000	21 x 28	March	May '45	Canadian
	40	2-8-2	Freight	198,000	35,000	21 x 28	September	1945	Canadian
	117	2-8-2	Freight	198,000	......	21 x 28	April	1945	Montreal
	60	2-8-2	Freight	198,000	......	21 x 28	September	1945	Montreal

Diesel, Electric, Gas-Mechanical and Other Internal-Combustion Locomotives

Railroad Orders—For Service in the United States

Purchaser	No.	Wheel arrangement	Service	Type	Weight	Horsepower	Date of Order	Date of Delivery	Builder Electrical Equipment-Locomotive Builder-Engine Builder
Alabama Great Southern	2	4(B-B)	Freight	Diesel-Elec.	856,000	5,400	November	......	Electro-Motive
Alabama, Tennessee & Northern	1	B-B	Rd. & Sw.	Diesel-Elec.	240,000	1,000	April	November	G. E.-American
	1	B-B	Rd. & Sw.	Diesel-Elec.	240,000	1,000	April	......	G. E.-American
	2	B-B	Rd. & Sw.	Diesel-Elec.	240,000	1,000	May	......	G. E.-American
Alton	5	B-B	Sw.	Diesel-Elec.	230,000	1,000	August	......	G. E.-American
	1	AIA-AIA	Road	Diesel-Elec.	313,300	2,000	July	......	Electro-Motive
Amador Central	1	B-B	Frt. & Sw.	Diesel-Elec.	88,000	380	August	......	G. E.-Caterpillar
Aroostook Valley	2	B-B	Frt. & Sw.	Diesel-Elec.	88,000	380	November	......	G. E.-Caterpillar

Purchaser	No.	Wheel arrangement	Service	Type	Weight	Horse-power	Date of Order	Date of Delivery	Builder Electrical Equipment-Locomotive Builder-Engine Builder
Atchison, Topeka & Santa Fe	10	4(B-B)	Freight	Diesel-Elec.	856,000	5,400	August	......	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	240,000	1,000	October	......	West.-Fairbanks, Morse
	2	3(AIA-AIA)	Passenger	Diesel-Elec.	1,008,000	6,000	September	......	G. E.-American
Atlanta & Sant Andrews Bay	2	B-B	Rd. & Sw.	Diesel-Elec.	230,000	1,000	July	......	G. E.-American
Atlanta & West Point—Western of Alabama	3	B-B	Sw.	Diesel-Elec.	240,000	1,000	May	September	West.-Baldwin
	1	B-B	Sw.	Diesel-Elec.	240,000	1,000	May	November	West.-Baldwin
Atlantic Coast Line	10	B-B	Sw.	Diesel-Elec.	230,000	1,000	May	December	G. E.-American
Baltimore & Ohio	10	B-B	Sw.	Diesel-Elec.	240,000	1,000	July	......	West.-Baldwin
	15	B-B	Sw.	Diesel-Elec.	230,000	1,000	July	......	G. E.-American
Boston & Maine	6	4(B-B)	Freight	Diesel-Elec.	856,000	5,400	May	......	Electro-Motive
	10	2(AIA-AIA)	Road	Diesel-Elec.	626,600	4,000	September	......	Electro-Motive
	3	B-B	Sw.	Diesel-Elec.	198,000	660	September	......	G. E.-American
Central Adelaida	1	B	Sw.	Diesel-Elec.	50,000	150	October	......	West.-Whit.-Cummins
Chicago & Eastern Illinois	4	B-B	Sw.	Diesel-Elec.	230,000	1,000	October	......	G. E.-American
	2	AIA-AIA	Road	Diesel-Elec.	313,300	2,000	November	......	Electro-Motive
Chicago & North Western	2	4(B-B)	Freight	Diesel-Elec.	856,000	5,400	June	......	Electro-Motive
	4	AIA-AIA	Road	Diesel-Elec.	313,300	2,000	June	......	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	240,000	1,000	February	August	West.-Baldwin
	7	B-B	Sw.	Diesel-Elec.	240,000	1,000	October	......	West.-Baldwin
	10	B-B	Sw.	Diesel-Elec.	198,500	660	October	......	West.-Baldwin
	1	B-B	Sw.	Diesel-Elec.	240,000	1,000	October	November	West.-Fairbanks, Morse
	5	B-B	Sw.	Diesel-Elec.	198,000	660	February	September	G. E.-American
(For Chicago, St. Paul, Minneapolis & Omaha)	2	B-B	Sw.	Diesel-Elec.	240,000	1,000	October	......	West.-Baldwin
	3	B-B	Sw.	Diesel-Elec.	198,000	660	October	......	West.-Baldwin
	2	B-B	Sw.	Diesel-Elec.	198,000	660	February	November	G. E.-American
Chicago & Western Indiana (for Belt of Chicago)	1	B-B	Sw.	Diesel-Elec.	240,000	1,000	March	October	West.-Baldwin
	1	B-B	Sw.	Diesel-Elec.	230,000	1,000	August	October	G. E.-American
Chicago, Burlington & Quincy	20	B-B	Sw.	Diesel-Elec.	240,000	1,000	June	Oct.-Nov.	West.-Baldwin
	30	B-B	Sw.	Diesel-Elec.	240,000	1,000	June	......	West.-Baldwin
	10	B-B	Freight	Diesel-Elec.	214,000	1,350	May	......	Electro-Motive
	28	AIA-AIA	Road	Diesel-Elec.	313,300	2,000	May	......	Electro-Motive
Chicago, Milwaukee, St. Paul & Pacific	5	4(B-B)	Freight	Diesel-Elec.	856,000	5,400	August	......	Electro-Motive
	5	2(AIA-AIA)	Road	Diesel-Elec.	626,600	4,000	August	......	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	240,000	1,000	May	August	West.-Fairbanks, Morse
Chicago, Rock Island & Pacific	6	AIA-AIA	Road	Diesel-Elec.	313,300	2,000	May	......	Electro-Motive
Chicago Short Line	1	B-B	Sw.	Diesel-Elec.	240,000	1,000	July	......	West.-Baldwin
Chicago, West Pullman & Southern	1	B-B	Sw.	Diesel-Elec.	230,000	1,000	March	October	G. E.-American
Clarendon & Pittsford	2	B-B	Sw.	Diesel-Elec.	100,000	380	June	......	West.-Whit.-Cater.
Delaware & Hudson	1	B-B	Sw.	Diesel-Elec.	230,000	1,000	March	May	G. E.-American
	1	B-B	Sw.	Diesel-Elec.	230,000	1,000	May	September	G. E.-American
Denver & Rio Grande Western	2‡	B-B	Sw.	Diesel-Elec.	230,000	1,000	Sept. '43	March	G. E.-American
	3‡	B-B	Sw.	Diesel-Elec.	230,000	1,000	Sept. '43	May	G. E.-American
Detroit Terminal	2	B-B	Sw.	Diesel-Elec.	240,000	1,000	August	......	West.-Baldwin
Fernwood, Columbia & Gulf	3	B-B	Frt. & Sw.	Diesel-Elec.	88,000	380	April	......	G. E.-Caterpillar
Grand Trunk Western	5	B-B	Sw.	Diesel-Elec.	230,000	1,000	March	August	G. E.-American
	5	B-B	Sw.	Diesel-Elec.	230,000	1,000	April	August	G. E.-American
Great Northern	2	4(B-B)	Freight	Diesel-Elec.	856,000	5,400	March	......	Electro-Motive
	5	3(B-B)	Freight	Diesel-Elec.	642,000	4,050	March	......	Electro-Motive
	6	B-B	Sw.	Diesel-Elec.	240,000	1,000	March	August	West.-Baldwin
	4	B-B	Rd. & Sw.	Diesel-Elec.	240,000	1,000	March	October	G. E.-American
Gulf, Mobile & Ohio	2	B-B	Rd. & Sw.	Diesel-Elec.	240,000	1,000	April	Nov.-Dec.	G. E.-American
	1	B-B	Rd. & Sw.	Diesel-Elec.	240,000	1,000	June	December	G. E.-American
	1	B-B	Rd. & Sw.	Diesel-Elec.	240,000	1,000	June	......	G. E.-American
	5	B-B	Rd. & Sw.	Diesel-Elec.	240,000	1,000	July	......	G. E.-American
Genessee & Wyoming	1‡	B-B	Sw.	Diesel-Elec.	160,000	500	Dec. '43	July	G.-E.-Cummins
Houston Belt & Terminal	1	B-B	Sw.	Diesel-Elec.	230,000	1,000	March	September	G. E.-American
Illinois Central	10	B-B	Sw.	Diesel-Elec.	198,000	600	August	......	Electro-Motive
	10	B-B	Sw.	Diesel-Elec.	250,000	1,000	August	......	Electro-Motive
	14	AIA-AIA	Road	Diesel-Elec.	313,300	2,000	August	......	Electro-Motive
Kentucky & Indiana Terminal	10	B-B	Sw.	Diesel-Elec.	240,000	1,000	October	......	West.-Baldwin
Maine Central	3	B-B	Frt. & Sw.	Diesel-Elec.	88,000	380	August	......	G. E.-Caterpillar
	2	B-B	Sw.	Diesel-Elec.	198,000	660	June	......	G. E.-American
Manufacturers	1	B-B	Sw.	Diesel-Elec.	230,000	1,000	February	September	G. E.-American
Minneapolis & St. Louis	1	B-B	Sw.	Diesel-Elec.	240,000	1,000	October	October	West.-Baldwin
	2	B-B	Rd. & Sw.	Diesel-Elec.	240,000	1,000	May	......	G. E.-American
	2	3(B-B)	Freight	Diesel-Elec.	642,000	4,050	May	......	Electro-Motive
Minneapolis, St. Paul & Sault Ste. Marie (for Duluth, South Shore & Atlantic)	2	B-B	Rd. & Sw.	Diesel-Elec.	240,000	1,000	October	......	G. E.-American
Missouri Pacific	3	B-B	Sw.	Diesel-Elec.	240,000	1,000	September	......	West.-Baldwin
	2	B-B	Sw.	Diesel-Elec.	230,000	1,000	September	....	G. S.-American
	2	4(B-B)	Freight	Diesel-Elec.	856,000	5,400	September	......	Electro-Motive
Monongahela Connecting	2	B-B	Sw.	Diesel-Elec.	252,000	1,100	March	......	G. E.-Coop. Bess.
Muncie & Western	1	B-B	Sw.	Diesel-Elec.	130,000	400	January	May	G. E.-Cummins
New York Central	4	3(AIA-AIA)	Road	Diesel-Elec.	939,900	6,000	January	......	Electro-Motive
	5	B-B	Sw.	Diesel-Elec.	240,000	1,000	June	Sept.-Oct.	West.-Baldwin
	3	B-B	Sw.	Diesel-Elec.	240,000	1,000	June	......	West.-Baldwin
	7	B-B	Sw.	Diesel-Elec.	198,500	660	June	......	West.-Baldwin
	15	B-B	Sw.	Diesel-Elec.	230,000	1,000	May	Sept.-Dec.	G. E.-American
	10	B-B	Sw.	Diesel-Elec.	230,000	1,000	May	......	G. E.-American
	15	B-B	Sw.	Diesel-Elec.	198,000	660	May	......	G. E.-American
New York, New Haven & Hartford	10	B-B	Frt. & Sw.	Diesel-Elec.	88,000	380	March	......	G. E.-Caterpillar
	20	AIA-AIA	Frt. & Pass.	Diesel-Elec.	336,000	2,000	March	......	G. E.-American
	12	B-B	Sw.	Diesel-Elec.	230,000	1,000	March	Aug.-Nov.	G. E.-American
New York, Ontario & Western	16	B-B	Sw.	Diesel-Elec.	250,000	1,000	June	......	Electro-Motive
	4	4(B-B)	Freight	Diesel-Elec.	856,000	5,400	June	......	Electro-Motive
	1	3(B-B)	Freight	Diesel-Elec.	856,000	4,050	June	......	Electro-Motive
	8	2(B-B)	Freight	Diesel-Elec.	428,000	2,700	June	......	Electro-Motive
	8	B-B	Freight	Diesel-Elec.	214,000	1,350	June	......	Electro-Motive
New York, Susquehanna & Western	1	B-B	Rd. & Sw.	Diesel-Elec.	240,000	1,000	June	November	G. E.-American
	7	B-B	Rd. & Sw.	Diesel-Elec.	240,000	1,000	June	......	G. E.-American
Northern Pacific	8	B-B	Sw.	Diesel-Elec.	240,000	1,000	August	......	West.-Baldwin
	4	B-B	Sw.	Diesel-Elec.	230,000	1,000	August	......	G. E.-American
Pacific Electric	3‡	B-B	Frt. & Sw.	Diesel-Elec.	88,000	380	Dec. '43	October	G. E.-Caterpillar
Pennsylvania	1	2(AIA-AIA)	Road	Diesel-Elec.	626,600	4,000	September	......	Electro-Motive
Pere Marquette	2	AIA-AIA	Road	Diesel-Elec.	313,300	2,000	April	......	Electro-Motive
Reading Company	5	B-B	Sw.	Diesel-Elec.	240,000	1,000	March	Aug.-Sept.	West.-Baldwin
Richmond, Fredericksburg & Potomac	2	B-B	Sw.	Diesel-Elec.	230,000	1,000	April	October	G. E.-American
St. Louis-San Francisco	7	B-B	Sw.	Diesel-Elec.	240,000	1,000	August	......	West.-Baldwin
St Louis Southwestern	2	B-B	Sw.	Diesel-Elec.	240,000	1,000	July	......	West.-Baldwin
	7	B-B	Sw.	Diesel-Elec.	240,000	1,000	October	......	West.-Baldwin
	2	4(B-B)	Freight	Diesel-Elec.	856,000	5,400	July	......	Electro-Motive

‡ 1943 totals have been adjusted to include these locomotives which were not reported last year.

Purchaser	No.	Wheel arrangement	Service	Type	Weight	Horsepower	Date of Order	Date of Delivery	Builder Electrical Equipment-Locomotive Builder-Engine Builder
Seaboard Air Line	4	B-B	Sw.	Diesel-Elec.	240,000	1,000	June	......	West.-Baldwin
Southern	2	4(B-B)	Freight	Diesel-Elec.	856,000	5,400	March	......	Electro-Motive
	6	2(AIA-AIA)	Road	Diesel-Elec.	626,600	4,000	June	......	Electro-Motive
	2	4(B-B)	Freight	Diesel-Elec.	856,000	5,400	November	......	Electro-Motive
	5	B-B	Sw.	Diesel-Elec.	230,000	1,000	March	September	G. E.-American
	8	B-B	Sw.	Diesel-Elec.	230,000	1,000	May	Nov.-Dec.	G. E.-American
	7	B-B	Sw.	Diesel-Elec.	230,000	1,000	October	......	G. E.-American
Southern Pacific (for Visalia Electric)	2	B-B	Sw.	Diesel-Elec.	88,000	380	November	......	G. E.-Caterpillar
State Belt	2‡	B-B	Sw.	Diesel-Elec.	230,000	1,000	Oct. '43	March	G. E.-American
Tama & Toledo	1	B	Sw.	Diesel-Elec.	50,000	150	June	......	G. E. Cummins
Terminal R. R. Assn. of St. Louis	4	B-B	Sw.	Diesel-Elec.	240,000	1,000	February	Aug.-Sept.	West.-Baldwin
	1	B-B	Sw.	Diesel-Elec.	240,000	1,000	March	September	West.-Baldwin
	10	B-B	Sw.	Diesel-Elec.	230,000	1,000	February	September	G. E.-American
Texas & New Orleans	3	B-B	Sw.	Diesel-Elec.	230,000	1,000	1944	July	G. E.-American
Wabash	1	AIA-AIA	Road	Diesel-Elec.	313,300	2,000	July	......	Electro-Motive
Washington Terminal	1‡	B-B	Rd. & Sw.	Diesel-Elec.	240,000	1,000	Nov. '43	April	G. E.-American
	3‡	B-B	Rd. & Sw.	Diesel-Elec.	240,000	1,000	Nov. '43	June-July	G. E.-American

‡ 1943 totals have been adjusted to include these locomotives which were not reported last year.

Industrial and Private Car Line Orders—For Service in the United States

Purchaser	No.	Wheel arrangement	Service	Type	Weight	Horsepower	Date of Order	Date of Delivery	Builder Electrical Equipment-Locomotive Builder-Engine Builder
Aluminum Industries, Inc.	1	B	Sw.	Diesel-Elec.	50,000	150	July	......	G. E.-Cummins
American Radiator & Standard Sanitary Corp.	1	B-B	Sw.	Diesel-Elec.	90,000	300	April	......	G. E.-Cummins
American Steel Foundries	1	B-B	Sw.	Diesel-Elec.	130,000	400	August	Mar. '45	G. E.-Whit.-Cummins
Bethlehem Steel Corp.	1	B	Sw.	Diesel-Elec.	40,000	150	April	......	G. E.-Cummins
	2‡	B	Sw.	Diesel-Elec.	100,000	300	Dec. '43	May-June	G. E.-Cummins
Buckeye Steel Castings Co.	1	B-B	Sw.	Diesel-Elec.	130,000	400	May	September	G. E.-Cummins
Carnegie-Illinois Steel Corp.	1	B-B	Sw.	Diesel-Elec.	160,000	500	August	......	G. E.-Cummins
Central State Hospital	1	B	Sw.	Gas. Mech.	50,000	175	February	March	Fate.Root.Heath-Le Roi
Chapman Valve Mfg. Co.	1	B	Sw.	Diesel-Elec.	50,000	150	January	June	G. E.-Cummins
Columbia Steel Corp.	4‡	B-B	Sw.	Diesel-Elec.	160,000	500	Dec. '43	......	G. E.-Cummins
Continental Steel Corp.	1	B-B	Sw.	Diesel-Elec.	130,000	500	February	......	G. E.-Coop. Bess.
Copperweld Steel Co.	1	B-B	Sw.	Diesel-Elec.	130,000	400	March	August	G. E.-Cummins
Donner-Hanna Coke Corp.	1	B-B	Sw.	Diesel-Elec.	90,000	300	August	......	G. E.-Cummins
DuPont de Nemours, E. I., & Co.	2	B	Sw.	Gas.-Mech.	60,000	175	March	May-June	Fate.Root.Health-Le Roi
	1	B-B	Sw.	Diesel-Elec.	90,000	300	January	June	G. E.-Cummins
Florence Pipe, Fdry., & Mach. Co.	1	B-B	Sw.	Diesel-Elec.	100,000	300	September	......	G. E.-Cummins
General Electric Co.	1	B-B	Sw.	Diesel-Elec.	160,000	500	May	......	G. E.-Cummins
General Steel Castings Co.	2	B-B	Sw.	Diesel-Elec.	130,000	400	June	December	West.-Whit.-Cummins
Great Lakes Steel	3	B-B	Sw.	Diesel-Elec.	198,000	600	June	......	Electro-Motive
Gulf Wood Preserving Corp.	1	B-B	Sw.	Diesel-Elec.	50,000	150	May	September	G. E.-Cummins
Harrisburg Steel Corp.	1	B	Sw.	Diesel-Elec.	90,000	300	February	......	G. E.-Cummins
Hughes Tool Co.	1	B	Sw.	Diesel-Mech.	60,000	190	February	April	West.-Whit.-Cater.
	1	B	Sw.	Diesel-Mech.	60,000	190	June	September	West.-Whit.-Cater.
International General Electric Co.	4	B-B	Frt. & Sw.	Diesel-Elec.	88,000	380	April	......	G. E.-Caterpillar
Jefferson Lake Sulphur Co.	1	B	Sw.	Diesel Mech.	36,000	145	June	July	Fate.Root.Heath-Cater.
Kaiser Company	1	B-B	Sw.	Diesel-Elec.	90,000	300	June	......	G. E.-Cummins
Kansas City Power & Light Co.	1	B-B	Frt. & Sw.	Diesel-Elec.	88,000	380	July	......	G. E.-Caterpillar
Koppers Company	1	B	Sw.	Diesel-Elec.	50,000	150	March	August	G. E.-Cummins
	1	B	Sw.	Electric	40,000	150	January	......	General Electric
	2	B	Sw.	Electric	40,000	150	October	......	General Electric
Lehigh Portland Cement Co.	1	B	Sw.	Diesel-Elec.	50,000	150	June	......	G. E.-Cummins
Lone Star Cement Co.	2	B-B	Sw.	Diesel-Elec.	90,000	300	March	July-August	G. E.-Cummins
Marquette Cement Co.	1	B-B	Sw.	Diesel-Elec.	90,000	300	April	......	G. E.-Cummins
Morrell, John, & Co.	1‡	B-B	Sw.	Diesel-Elec.	198,000	660	Dec. '43	December	G. E.-American
New York State Elec. & Gas Corp.	1	B	Sw.	Gas.-Mech.	50,000	175	March	June	Fate.Root.Health-Le Roi
Northwest Paper Co.	1	B-B	Sw.	Diesel-Elec.	100,000	300	August	......	G. E.-Cummins
Pacific Coast Aggregates, Inc.	1	B	Sw.	Diesel-Elec.	50,000	150	April	September	G. E.-Cummins
	1	B	Sw.	Diesel-Elec.	50,000	150	September	......	G. E.-Cummins
Pennsylvania Electric Co.	1	B	Sw.	Diesel-Elec.	50,000	150	June	......	G. E.-Cummins
Pittsburgh Plate Glass Co.	1	B	Sw.	Diesel-Mech.	90,000	340	January	......	Fate.Rt.Heath.Coop.Bes.
Port of Tacoma, Wash.	1	B-B	Sw.	Diesel-Elec.	130,000	400	November	......	G. E.-Cummins
Prattsburg Corp.	1	C	Frt.	Gas.-Mech.	70,000	250	June	October	Fate.Root.Health-Le Roi
Public Service of Indiana	1‡	B-B	Sw.	Diesel-Elec.	90,000	300	Dec. '43	......	G. E.-Cummins
Pullman-Standard Car Mfg. Co.	1	B	Sw.	Diesel-Elec.	50,000	150	March	July	G. E.-Cummins
Republic Steel Corp.	7	B-B	Sw.	Diesel-Elec.	198,000	600	July	......	Electro-Motive
	2	B-B	Sw.	Diesel-Elec.	160,000	500	March	......	G. E.-Cummins
	3	B-B	Sw.	Diesel-Elec.	198,000	660	March	......	G. E.-American
St. Regis Paper Co.	1	B	Sw.	Gas.-Mech.	36,000	150	June	August	Fate.Root.Heath-Buda
Semet-Solvay Co.	1	B-B	Sw.	Diesel-Elec.	160,000	500	September	......	G. E.-Cummins
Shell Oil Co.	1	B-B	Sw.	Diesel-Elec.	90,000	300	July	......	G. E.-Cummins
Southland Paper Mills	1	B-B	Sw.	Diesel-Elec.	90,000	300	April	......	G. E.-Cummins
Swift & Co.	1	B-B	Sw.	Diesel-Elec.	88,000	380	September	......	G. E.-Caterpillar
Truax Traer Coal Co.	1	B-B	Sw.	Diesel-Elec.	198,000	660	May	November	G. E.-American
	1	B-B	Sw.	Diesel-Elec.	198,000	660	May	......	G. E.-American
Wheeling Steel Corp.	1	B-B	Sw.	Diesel-Elec.	90,000	300	January	......	G. E.-Cummins
Youngstown Sheet & Tube Co.	2	B-B	Sw.	Diesel-Elec.	198,500	660	February	......	West.-Baldwin
	2	B-B	Sw.	Diesel-Elec.	198,500	660	May	......	West.-Baldwin
	4	B-B	Sw.	Diesel-Elec.	198,500	660	July	......	West.-Baldwin

‡ 1943 totals have been adjusted to include these locomotives which were not reported last year.

United States—Export

Purchaser	No.	Wheel arrangement	Service	Type	Weight	Horsepower	Date of Order	Date of Delivery	Builder Electrical Equipment-Locomotive Builder-Engine Builder
Canadian Pacific	10	B-B	Sw.	Diesel-Elec.	230,000	1,000	January	October	G. E.-American
	13	B-B	Sw.	Diesel-Elec.	230,000	1,000	November	1945	G. E.-American
Chilean State Rys.	2	B-B	Frt. & Sw.	Diesel-Elec.	88,000	380	January	......	G. E.-Caterpillar
Mexican Government Railways	10‡	B-B	Sw.	Diesel-Elec.	230,000	1,000	Sept. '43	Aug.-Sept.	G. E.-American
	5‡	B-B	Sw.	Diesel-Elec.	198,000	660	Sept. '43	Aug.-Sept.	G. E.-American
Paulista of Brazil	12	2-C+C-2	Pass. & Frt.	Electric	364,000	4,050	February	......	General Electric
Valparaiso Port Administration	2	B-B	Sw.	Diesel-Elec.	88,000	400	October	......	West.-Whit.-Cummins

‡ 1943 totals have been adjusted to include these locomotives which were not reported last year.

PASSENGER CARS *once more*

Railroads order 540 new cars in 1944—backlog now exceeds 1,000—10,000-15,000 more predicted

By ARTHUR J. McGINNIS
Associate Editor

FOLLOWING an announcement in September by the American Car & Foundry Co. that it was expending $1,500,000 to expand its St. Charles, Mo., passenger-train car building plant, simultaneous announcements were issued in October, by the War Manpower Commission declaring the St. Charles area "non-critical," and by the War Production Board releasing steel and aluminum for the construction of 55 cars in the a.c.f. plant. Orders for materials for these cars were placed immediately and building was scheduled to follow completion of the 100 hospital car program under way for the U. S. War Department—the only type of passenger car then being constructed. This action of the government permitted the first resumption of railroad passenger car building since completion of deliveries of 242 cars during 1942 ended for a time new additions to our domestic supply of this equipment, in accordance with the 1941 ruling of the former Supply, Priorities and Allocations Board, predecessor of the W. P. B., by which scarce materials were diverted from passenger car construction to other purposes.

In November, the Office of Defense Transportation, "claimant agency" for domestic transportation under the controlled materials plan, announced that materials for the construction of 105 passenger-train cars, chiefly day coaches with some baggage, mail and express cars, had been made available by the W. P. B. in its allocations for the first quarter, 1945. Under the controlled materials plan, requests for, and tentative allocations of materials are made about three quarters ahead.

The War Production Board also approved the O. D. T.'s program calling for the construction of 250 passenger cars quarterly. However, as material allocations for regular civilian production are being made subject to the availability of manpower at the point of manufacture, up to the time of this publication date, not enough plants had been released from the "critical shortage" category to permit the definite scheduling of this number of cars. No final action had been reported on the application of the Pullman-Standard Car Manufacturing Company to resume passenger car building in its Chicago plant, although the company's Worcester, Mass., plant was released. Only building authorization approved for the Philadelphia, Pa., plant of the Edward G. Budd Manufacturing Company covered 21 coach and baggage cars on order since 1941 for the Atchison, Topeka & Santa Fe, for which most of the materials were on hand

Anticipating the government's action permitting resumption of building in 1944, eleven railroads placed orders during the year for a total of 540 new passenger cars, of which 337 were coaches, 74 baggage, mail or express-type cars, 41 diner, 22 sleeping, bedroom or similar-type cars, and the remainder combination cars of various classes. Of the 540 cars, 157 were reported authorized for building—90 coaches, 63 baggage-express-type cars and four diners.

These 540 new cars ordered are listed in detail in the appended tables. There are also included in the tables, as supplemental information, a number of cars for domestic service and for export, orders for which were placed tentatively during the past four years, 1941-1944. As indicated by a footnote to the tabulation, because these orders are reported as tentative only, they are not included in the totals of orders tabulated in Table I.

Four railroads are listed as indicating intention to purchase new passenger-train equipment by placing tentative orders for 172 cars as follows: the Atchison, Topeka & Santa Fe, 80; the Atlantic Coast Line, 12; the Boston & Maine, 20; and the Seaboard Air Line, 60. Tentative orders also were placed here for 424 coaches for export, 374 to the Central of Brazil and 50 to the National Railways of Mexico.

Several other railroads have disclosed plans for the acquisition of new equipment. The Illinois Central is

Table I—Passenger-Train Cars Ordered, 1929-1944

Year	Domestic	U. S. Export	Total U. S.	Canadian
1944	540	..	540	..
1943	70	..	70	..
1942	2	..	2	..
1941	497	19	516	72
1940	389	21	410	65
1939	320	28	348	87*
1938	274	..	274	24
1937	679	..	679	99
1936	425	..	425	10
1935	95	..	95	16
1934	388	15	403	..
1933	6	..	6	..
1932	39	..	39	..
1931	11	21	33	11
1930	648	15	663	203
1929	2,322	33	2,355	122

Note.—The totals of domestic and U. S. export orders for years 1941-1944 exclude U. S. Government purchases. Domestic orders placed in 1941-1943 are adjusted to eliminate orders subsequently cancelled due to WPB restrictions on building. In certain instances domestic orders placed in December are not reported until following year; statistics for years 1929-1943 are adjusted to eliminate this overlap.

Table II—Passenger-Train Cars Built, 1929-1944

Year	Domestic	U. S. Export	Total U. S.	Canadian
1944				
1943	...	21	21	..
1942	242	11	253	40
1941	299	8	307	32
1940	142	28	170	30
1939	194	..	194	27*
1938	264	..	264	38
1937	664	..	664	70
1936	142	..	142	10
1935	197	..	197	..
1934	268	15	283	..
1933	6	..	6	..
1932	39	..	39	..
1931	198	21	219	66
1930	1,264	40	1,304	210
1929	1,254	20	1,274	162

* Includes export deliveries.
Note.—Passenger-train cars built for the U. S. Government and for lend-lease not reported in 1942-1944.

Passenger-Train Cars Ordered in 1944

For Service in the United States

Purchaser	No.	Class	Length Ft.	Length In.	Seating Capacity	Weight	Date of Order	Date of Delivery	Builder
Atchison, Topeka & Santa Fe (See Note)	7	Mail	63	4	..	87,000	August	*	Budd
	16	Baggage	72	8	..	89,000	August	*	Budd
	31 AC	Coach	85	0	52	107,000	August	*	Budd
	11 AC	Coach	85	0	72	109,000	August	*	Budd
	1 AC	Coach-Obs.	85	0	54	107,000	August	*	Budd
	11 AC	Coach-Lge.-Dorm	85	0	39	114,000	August	*	Budd
	1 AC	Diner	85	0	36	116,000	August	*	Budd
	1 AC	Club-Lounge	85	0	52	108,000	August	*	Budd
	1 AC	Bag.-Dorm.	85	0	..	108,000	August	*	Budd
Atlantic Coast Line (See Note)	12 AC	Coach	85	0	56	109,000	June '41	*	Budd
Boston & Maine (See Note)	4 AC	Coach-Bag.	85	0	..	108,000	Oct. '43	*	Budd
	16 AC	Coach	85	0	..	109,000	Oct. '43	*	Budd
Central of Georgia	6[2]	Bag.-Exp.	70	9	..	105,500	April	July '45	Amer. Car & Fdy.
	2[2]	Bag.-Mail	70	9	..	108,200	April	July '45	Amer. Car & Fdy.
	10	....	..	..	..	....	September	*	Budd
Chicago & North Western	20 AC	Coach	80	4	66	115,000	May	*	Pullman-Standard
Florida East Coast	2 AC[1]	Pass.-Bag.-Dorm.	85	0	21	109,000	May '43	*	Budd
	2 AC[1]	Tav.-Lounge	85	0	56	109,000	May '43	*	Budd
	2 AC[1]	Diner	85	0	48	116,000	May '43	*	Budd
	8 AC[1]	Coach	85	0	56	109,000	May '43	*	Budd
	50	Express Box	40	6	..	48,500	May	Jan. '45	Magor Car
Great Northern	5	Bag.-Mail	85	0	..	......	May	*	Pullman-Standard
	5 AC	Coach	85	0	60	......	May	*	Pullman-Standard
	15 AC	Coach	85	0	48	......	May	*	Pullman-Standard
	5 AC	Coff.Sh.-Kit.-Dor.	85	0	47	......	May	*	Pullman-Standard
	5 AC	Diner	85	0	48	......	May	*	Pullman-Standard
	10 AC	Sleeping	85	0	24	......	May	*	Pullman-Standard
	5 AC	Bed Room	85	0	22	......	May	*	Pullman-Standard
	5 AC	Bed Room-Lounge	85	0	35	......	May	*	Pullman-Standard
	1 AC	Business	..	..	..	......	May	*	Pullman-Standard
Louisville & Nashville	16 AC	Coach	84	6	60	101,900	March	July '45	Amer. Car & Fdy.
	4 AC	Coach	84	6	58	102,400	March	July '45	Amer. Car & Fdy.
	4 AC	Lounge	84	6	50	101,000	March		Amer. Car & Fdy.
	4 AC	Diner	84	6	48	109,700	March	July '45	Amer. Car & Fdy.
Minneapolis & St. Louis	6 AC	Coach	85	0	56	116,000	October	*	Budd
Missouri Pacific	2 AC[1]	Coach	85	0	56	112,000	Dec. '43	*	Budd
	4 AC[1]	Coach	85	0	70	112,000	Dec. '43	*	Budd
New York Central	60 AC	Coach	85	0	56	116,000	March	*	Budd
	4 AC	Diner	85	0	64	117,000	March	*	Budd
	4 AC	Kit.-Lounge	85	0	21	130,000	March	*	Budd
	4 AC	Tav.-Lounge-Obs.	85	0	50	114,000	March	*	Budd
	2 AC	Bag.-Dorm.	85	0		119,000	March	*	Budd
	13 AC	Tav.-Lounge	85	0	49	115,000	March	*	Budd
	13 AC	Parlor-Obs.	85	0	42	112,000	March	*	Budd
	18 AC	Grill-Diner	85	0	44	124,000	March	*	Budd
	9 AC	Diner	85	0	44	126,000	March	*	Budd
	50 AC	Coach	85	0	64	119,000	May	1945	Pullman-Standard
	103 AC	Coach	85	0	64	119,000	May	*	Pullman-Standard
	20 AC	Coach-Bag.	84	6	48	112,700	May	Aug. '45	Amer. Car & Fdy.
New York, Chicago & St. Louis	5	Baggage	70	0	..	107,500	June	Aug. '45	Amer. Car & Fdy.
Northern Pacific	36 AC	Coach	85	0	64	120,000	October	*	Pullman-Standard
Pere Marquette	2	Baggage	72	10	..	97,000	March	*	Pullman-Standard
	2	Mail-Exp.	72	10	..	102,000	March	*	Pullman-Standard
	4 AC	Coach-Lounge	84	6	78	110,000	March	*	Pullman-Standard
	4 AC	Coach-Obs.	84	6	74	111,000	March	*	Pullman-Standard
	2 AC	Diner-Lounge	84	6	58	120,000	March	*	Pullman-Standard
Seaboard Air Line (See Note)	4	Mail	..	..	..	......	July '43	*	Budd
	6 AC	Bag.-Dorm.	85	0	..	110,000	July '43	*	Budd
	3 AC	Club-Lounge	85	0	..	110,000	July '43	*	Budd
	4 AC	Tavern-Obs.	85	0	61	108,000	July '43	*	Budd
	10 AC	Diner	85	0	48	117,000	July '43	*	Budd
	33 AC	Coach	85	0	52	109,000	July '43	*	Budd
Wabash	1	Baggage	73	10	..	......	November	*	Amer. Car & Fdy.
	1	Bag.-Mail	73	10	..	......	November	*	Amer. Car & Fdy.
	2	Coach-Smoker	85	0	..	......	November	*	Amer. Car & Fdy.
	1	Coach-Buffet	85	0	..	......	November	*	Amer. Car & Fdy.
	1	Diner	85	0	..	......	November	*	Amer. Car & Fdy.
	1	Obs.-Chair	85	0	..	......	November	*	Amer. Car & Fdy.

United States—Export

Purchaser	No.	Class	Length Ft.	Length In.	Seating Capacity	Weight	Date of Order	Date of Delivery	Builder
Central of Brazil (See Note)	74	Coach	68	1	..	65,000	Dec. '42	*	Budd
	300	Coach	68	1	..	65,000	Mar. '43	*	Budd
National Ry. of Mexico (See Note)	50	Coach	..	..	..	......	Aug. '43	*	Budd

Note.—These orders were reported as tentative only and therefore are not included in the totals of orders placed in Table I. They are listed herein as supplemental information.

AC—Indicates cars are air-conditioned.

* Not authorized for building by War Production Board.

[1] 1943 totals in Table I have been adjusted to include these cars which were not reported last year.

[2] Original order for this equipment in March, 1943, was cancelled in February, 1944.

considering a new streamliner for operation between Chicago and St. Louis, Mo., and the transfer of its pre-war "Green Diamond" from this service to its Chicago-Waterloo, Iowa, service. The Chicago & Eastern Illinois is considering streamlined trains for its Chicago-St. Louis and Chicago-Evansville service and has asked car builders for prices. The Southern Pacific expects to re-equip its "Cascade" operating between Oakland, Cal., and Portland, Ore., as a streamliner. The Chicago, Rock Island & Pacific is reported considering the purchase of streamliners, having asked for prices, and the Denver & Rio Grande Western is considering acquiring ten new cars, including two mail-baggage, two baggage-dormitory, four coaches and two dining cars.

Including two baggage-express cars ordered by the Western of Alabama in April, 1942 from the American Car & Foundry Co., 50 coaches ordered by the Boston & Maine in July, 1943, from the Pullman-Standard Car Manufacturing Company, and other cars ordered earlier but "frozen" by the war, the current "backlog" of passenger cars on order is estimated to exceed 1,000.

The information in the appended tables was compiled from data furnished to the *Railway Age* by the rail-

(*Continued on page 101*)

FREIGHT CAR *inventory aging*

Restricted building programs limited domestic buying to 46,933 cars in 1944; backlog remains about 40,000

By *ARTHUR J. McGINNIS*
Associate Editor

DURING 1944, the volume of new freight car buying continued under the restraining influence of restricted building programs and fell far below requirements. Orders were placed for 46,933 cars for domestic service, 3,030 more than were delivered to this service during the year and more than a full year's output at currently projected production schedules. This compares with 40,541 cars ordered in 1943, in which year 31,591 were built. The backlog of orders at December 31, 1944, was expected to exceed 40,000 cars, slightly more than were on order and undelivered at the end of 1943.

Buying was paced by the monthly rate of deliveries from car building plants. As the backlog mounted due to the low rate of production obtaining during the first six months, orders dwindled in mid-year, and then increased during the final months as production was stepped up steadily—domestic deliveries for the final quarter increasing about 43 per cent over average deliveries during the first half, chiefly due to cutbacks in military requirements.

Of the 46,933 cars purchased in 1944, 44,825 were sought by 50 railroads and 2,108 by 44 industrial companies and private car lines. Railroad orders were divided 10,844, or 24 per cent, to company shops and 33,981, or 76 per cent, to contract car builders. Excepting for 400 refrigerator cars ordered by the American Refrigerator Transit Company from its own shops, all industial orders were placed with contract builders.

Few of the cars purchased were reported not released for building by the War Production Board and authorizations for these were expected, with some scheduled for delivery as far as a year ahead. The building of all-steel cars was resumed during 1944 and most of the cars ordered were for this type of construction, in contrast to last year when the majority were composite wood and steel. Of the 44,825 cars ordered by the carriers, 5,830 were delivered during the year. Only 319 were shipped of the total order by industrial companies.

In addition to the above domestic purchases, American builders received orders during the year for 4,304 cars for export to 26 companies in South America and Mexico, the largest volume of export orders received here since 1921. Included were 3,177 box, 170 hopper, 598 gondola, 161 flat, 64 tank, 50 cane, four air dump and 80 general service cars. Most of these, or 3,841, were for sixteen companies in Brazil, with the remainder for delivery in small lots to Chile, Colombia, Ecuador, Peru, Uraguay and Mexico. Of the total ordered, 354 were reported not authorized for building and only 101 were shipped. At the year's end, there were about 4,500 more cars comprised in inquiries received here from South American companies, the orders for which had not been placed. Orders in Canada in 1944 numbered 11,965 cars, chiefly for the Department of Munitions and Supply, the Canadian National and the Canadian Pacific.

A detailed listing of new freight cars ordered during 1944 is set forth in the appended table. An analysis and comparison of these orders with preceding years is presented herein in Tables I, II and III. The *Railway Age* is not permitted to publish, at this time, the number

Table I—Freight Cars Ordered for Domestic Service in 1944

Builder	Railroads	Industrial and Private Car Cos.	Total	Per Cent of Total
Company Shops	10,844	400	11,244	24
Contract Car Builders	33,981	1,708	35,689	76
Total	44,825	2,108	46,933	100

Note.—Orders by U. S. Government departments are excluded.

Table II—Domestic Car Orders by Type and Purchaser

Type of Freight Car Ordered	Railroads		Industrial and Private Car Cos.		Total Orders	
	1944	1943	1944	1943	1944	1943
Box	23,860	8,853	56	2	23,916	8,855
Hopper	12,695	18,675	31	25	12,726	18,700
Gondola	7,224	8,940	135	214	7,359	9,154
Flat	550	2,577	72	88	622	2,665
Tank	....	50	326	516	326	566
Refrigerator	3	....	1,412	....	1,415	....
Air-Dump	137	4	70	113	207	117
Caboose	56	437	....	....	56	437
Miscellaneous	300	47	6	....	306	47
Total	44,825	39,583	2,108	958	46,933	40,541

Note.—1943 totals are adjusted to eliminate orders subsequently cancelled in 1944 due to WPB restrictions on building.

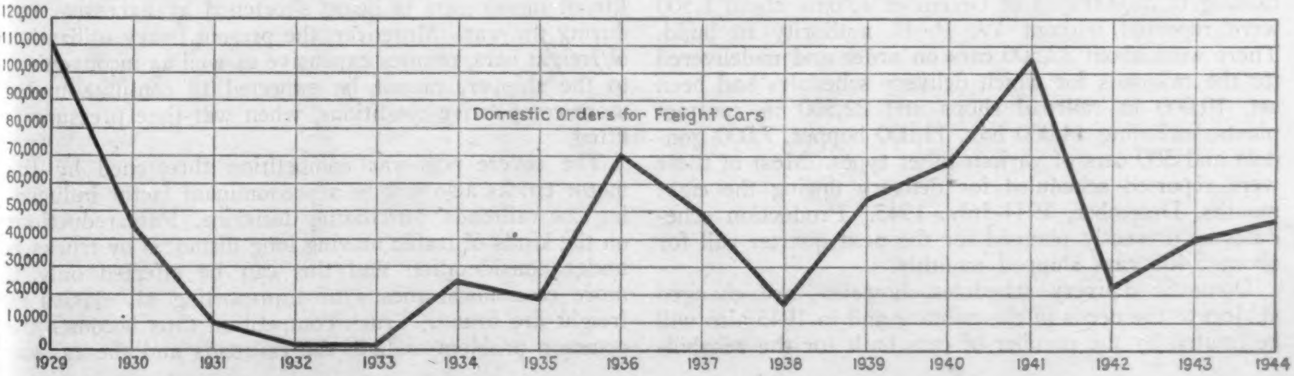


Table III—Total Freight Cars Ordered, 1929-1944

Year	Domestic	U. S. Export	Total U. S.	Canadian
1944	46,933	4,304	51,237	11,965
1943	40,541	872	41,413	5,650
1942	21,930	1,878	23,808	1,637*
1941	106,309	2,985	109,294	7,578*
1940	67,852	1,774	69,626	936
1939	54,441	1,476	55,917	7,007*
1938	16,647	442	17,089	4,902
1937	49,331	1,369	50,700	7,397
1936	70,842	526	71,368	271
1935	18,708	110	18,818	2,421
1934	24,610	1,323	25,933	12
1933	1,686	132	1,818	75
1932	1,968	77	2,045	501
1931	10,826	151	10,977	3,807
1930	45,731	1,200	46,931	1,936
1929	111,321	3,023	114,344	9,899

* Includes Canadian export orders.

Note.—The totals of domestic and U. S. export orders for years 1941-1944 exclude U. S. Government purchases. Domestic orders placed in 1941-1943 are adjusted to eliminate orders subsequently cancelled due to W.P.B. restrictions on building. In certain instances domestic orders placed in December are not reported until following year; statistics for years 1929-1943 are adjusted to eliminate this overlap.

of freight cars ordered or built for U. S. government departments, either for domestic service or for export, and these accordingly are omitted.

Freight cars built during 1944 for domestic service, exclusive of cars delivered to U. S. government departments, totaled 43,903, an increase of 12,312 over 1943. Of these, 28,711 were constructed by contract car-builders, 14,686 in 20 railroad shops and 506 by private car lines. (December deliveries are partially estimated.) In addition, there were 1,427 cars built in the United States for export, exclusive of lend-lease and government orders. Canadian deliveries numbered 7,950 cars, 6,445 for service in Canada and 1,505 for export. A comparison of 1944 deliveries with preceding years is presented in Table IV.

Production figures as used herein are not comparable with figures on the number of cars installed as reported in statistics issued by the A. A. R., since these latter include, in addition to new units acquired, cars re-built and rewritten into property accounts, used units acquired, leased units returned to service, and new and used units leased from others.

The Backlog on December 1

Because of the early publication date of this summary of orders and deliveries, the latest available figures estimating the backlog of cars on order and status of the car-building programs is as of December 1, 1944. On that date there were approximately 36,000 cars on order for domestic service, 34,000 for railroads and 2,000 for industrial companies and private car lines.

Under the War Production Board's controlled materials plan, freight cars are authorized for construction in advance from future materials allotments. This procedure aids car-building plants in planning production schedules and tends to hold down the accumulation of a large backlog of unauthorized orders. Thus, of the total backlog of 36,000 cars at December 1, only about 1,500 were reported without W. P. B. authority to build. There were about 32,500 cars on order and undelivered for the railroads for which delivery schedules had been set, 10,000 in railroad shops and 22,500 in contract plants, including 14,000 box, 11,000 hopper, 7,000 gondola and 500 cars of various other types. Most of these were reported scheduled for delivery during the eight months, December, 1944-July, 1945. Production schedules as presently planned for the next quarter call for about 5,400 cars shipped monthly.

Domestic delivery schedules, however, are changed subject to the needs of the military and in 1945 also will be limited by the number of cars built for the rehabilitation of the liberated countries of Europe. No definite program for this latter purpose has been reported as yet, but the number sought is larger, e. g., a supply commission for France is reported asking for 74,500 cars and 25,000 more are spoken of for Belgium. At a meeting of the Car Builders Industry Advisory Committee of the War Production Board in December, a new overall policy setting a ceiling for future non-military production, based on actual production in the fourth quarter of 1944, was outlined by W. P. B. officials. Even if there should be further cutbacks in military requirements, non-military claimants would be allowed to absorb such released productive capacity only after a special survey of the man-power supply in the labor areas affected. The aim of the W. P. B. was explained to be to assure that skilled labor needed for war production will not be used for such car production which is classified as non-military. At the meeting, available estimates allocated only 32,000 cars out of total 1945 production to the Office of Defense Transportation, through which railroad allocations are handled.

Source of Information

Prospects for the purchase of new freight cars by the railroads in the post-war period will depend chiefly on the total volume of national production and income then obtaining. Railroad purchases will follow the trend of railway traffic handled and net income earned thereby, which in turn will be influenced by the productive state of the nation. Making all the assumptions necessary in such long-term forecasting, estimates for the immediate five years following the lifting of government restrictions on building range from 70,000 to 120,000 cars annually, or a total of 350,000-600,000 cars.

Table IV—Freight Cars Built, 1929-1944

Year	Domestic	U. S. Export	Total U. S.	Canadian
1944	43,903	1,427	45,330	7,950*
1943	31,591	1,135	32,726	4,320
1942	59,571	4,908	64,479	867
1941	79,396	2,312	81,708	5,135*
1940	52,929	1,622	54,551	2,052
1939	24,876	181	25,057	2,206*
1938	17,473	549	18,022	5,115*
1937	75,003	1,121	76,124	6,595
1936	45,822	493	46,315	1,800
1935	6,933	888	7,821	801
1934	25,176	151	25,327	....
1933	2,160	151	2,311	550
1932	3,254	82	3,336	....
1931	13,205	409	13,614	4,633
1930	75,188	1,909	77,097	6,923
1929	82,240	3,168	85,408	8,557

* Includes Canadian export deliveries.

Note.—Domestic and U. S. export totals for 1942-1944 exclude freight cars built for the U. S. Government and lend-lease.

About one-third of the freight cars owned by class I railroads are over 25 years old, the startling increase in this number in recent years indicating that thousands of cars are being held in service beyond their economic life because they cannot be replaced in war-time. The service life of newer cars is being shortened by excessive use during the war. Moreover, the present heavy utilization of freight cars, oftimes expensive as well as inconvenient to the shipper, cannot be expected to continue under more competitive conditions, when war-time pressure is lifted.

The severe post-war competition threatened by the motor trucks also will be a predominant factor influencing the railroads' purchasing decisions. Rate reductions on the kinds of traffic moving long distances by trucks is under consideration and this can be effected only if more economical means of transporting all classes of freight are found. Truck competition thus becomes the common problem of both the railroads and the railway

Freight Cars Ordered in 1944

Railroad Orders—For Service in the United States

Purchaser	No.	Class	Capacity	Length ft.	Length in.	Construction	Weight	Date of Order	Date of Delivery	Builder
Akron, Canton & Youngstown	38	Box	80,000	..	..	......	.....	June	....	Company Shops
Alton	600	D. S. Box	100,000	40	6	Steel	45,000	August	May '45	Amer. Car & Fdy.
	150	Hopper	100,000	33	0	Steel	41,500	August	Apr. '45	Amer. Car & Fdy.
	250	Gondola	100,000	41	6	Steel	45,000	August	May '45	General American
	500	Box	100,000	40	6	Steel	45,800	August	May '45	Pullman-Standard
	10	D. S. Box	100,000	40	6	Aluminum	38,500	June	December	Mount Vernon
Atchison, Topeka & Santa Fe	2	Refrigerator	80,000	39	0	Composite	56,000	June	May-June '45	Consolidated Steel
	1	Refrigerator	80,000	..	..	Composite	.....	June	1945	Consolidated Steel
	500	Box	100,000	40	6	Steel	45,800	November	Apr.-June '45	Pullman-Standard
Atlanta & West Point	25	Box	100,000	40	6	Steel	44,700	March	Jan. '45	Pullman-Standard
Baltimore & Ohio	1,000	Hopper	100,000	33	0	Steel	.....	August	Feb.-May '45	Bethlehem
	500	Box	100,000	40	6	Steel	47,900	August	June '45	General American
	200	D. S. Box	100,000	56	6	Composite	56,100	August	Feb.-Mar. '45	Greenville
Bangor & Aroostook	35	Hopper	100,000	33	0	Steel	39,800	March	December	Amer. Car & Fdy.
	52	Box	80,000	40	5	Steel	45,500	March	Jan. '45	Magor Car
Central of Georgia	10	Cov. Hopper	140,000	29	3	Steel	52,800	February	September	Amer. Car & Fdy.
	250	D. S. Box	100,000	50	6	Steel	53,300	February	November	Amer. Car & Fdy.
	200	D. S. Box	100,000	40	6	Steel	47,700	February	November	Amer. Car & Fdy.
	650	D. S. Box	100,000	40	6	Steel	44,700	February	Dec.-Jan. '45	Pullman-Standard
	100	Hopper	100,000	33	0	Steel	38,500	February	Dec.-Jan. '45	Pullman-Standard
	100	Pulpwood	100,000	50	0	Composite	56,000	November	....	Greenville
Chesapeake & Ohio	2,500	Hopper	100,000	33	0	Steel	39,800	March	Apr. '45	Amer. Car & Fdy.
	1,250	Hopper	100,000	33	0	Steel	39,800	March	Nov.-Feb. '45	General American
	1,250	Hopper	100,000	33	0	Steel	40,570	March	Oct.-Feb. '45	Pullman-Standard
	990	Box	100,000	40	6	Steel	45,500	December	....	Pullman-Standard
Chicago & Eastern Illinois	200	Hopper	100,000	33	0	Steel	41,000	April	Feb. '45	Mount Vernon
	500	Hopper	100,000	..	..	Steel	100,000	December	....	Pullman-Standard
Chicago & North Western	800	S. S. Box	100,000	40	6	Steel	46,500	March	Jan. '45	Amer. Car & Fdy.
	600	Box	100,000	40	6	Steel	45,900	March	Jan.-Feb. '45	General American
	600	Box	100,000	40	6	Steel	45,800	March	1945	Pullman-Standard
	750	Gondola	140,000	41	6	Steel	50,000	November	Aug.-Sept. '45	Bethlehem
	500	Hopper	140,000	40	8	Steel	51,500	November	Aug.-Sept. '45	Pullman-Standard
	250	Ballast	140,000	40	8	Steel	54,500	November	Apr.-June '45	Amer. Car & Fdy.
	500	Hopper	140,000	40	8	Steel	49,500	November	July-Sept. '45	General American
(For Chicago, St. Paul, Minneapolis & Omaha)	400	S. S. Box	100,000	40	6	Steel	47,000	November	Apr.-June '45	Amer. Car & Fdy.
	100	Hopper	100,000	33	0	Steel	41,000	November	Apr.-June '45	Mount Vernon
Chicago, Burlington & Quincy	100	Cov. Hopper	140,000	29	3	Steel	51,900	September	1945	Company Shops
	650	Hopper	110,000	34	3	Steel	38,800	September	1945	Company Shops
	100	Hopper	100,000	34	3	Steel	38,800	April	1945	Company Shops
	50	Air Dump	100,000	..	..	Steel	.....	June	....	Austin-Western
Chicago Great Western	100	Hopper	140,000	40	8	Steel	51,500	February	Nov.-Dec.	Pullman-Standard
Chicago, Milwaukee, St. Paul & Pacific	25	Air Dump	100,000	..	..	Steel	.....	January	....	Austin-Western
	1,500	Gondola	100,000	41	6	Composite	.....	July	Jan.-Aug. '45	Company Shops
Chicago, Rock Island & Pacific	500	S. S. Box	100,000	40	6	Steel	46,100	March	Dec.-Feb. '45	Pressed Steel
	10	D. S. Box	100,000	40	6	Aluminum	38,500	June	December	Mount Vernon
Colorado & Wyoming	50	Ballast	140,000	..	..	Steel	.....	December	....	Amer. Car & Fdy.
Delaware, Lackawanna & Western	350	D. S. Box	100,000	40	6	Steel	46,000	March	Jan. '45	Amer. Car & Fdy.
	250	Box	100,000	40	6	Steel	45,900	March	December	Magor Car
Denver & Rio Grande Western	10	Caboose	......	..	..	......	.....	January	....	Company Shops
	200	Stock	80,000	..	..	......	.....	February	....	Company Shops
Erie	600	Hopper	100,000	33	0	Steel	41,500	March	Nov.-Dec.	Greenville
	500	Box	100,000	..	..	Steel	.....	December	....	Amer. Car & Fdy.
Florida East Coast	50	D. S. Box	100,000	40	6	Steel	45,900	May	Jan. '45	Magor Car
Georgia	75	Box	100,000	40	6	Steel	44,700	March	Jan. '45	Pullman-Standard
	100	Hopper	100,000	33	0	Steel	38,500	March	December	Pullman-Standard
Grand Trunk Western	500	Box	80,000	50	6	Steel	.....	December	....	Pressed Steel
Great Northern	3	Caboose	80,000	30	0	Composite	52,600	February	March	Company Shops
	1	Caboose	80,000	30	0	Composite	52,600	June	September	Company Shops
	500	Gondola	100,000	40	6	Steel	.....	December	July-Sept. '45	Pressed Steel
	250	Flat	140,000	52	0	Steel	56,000	December	...	Amer. Car & Fdy.
Gulf, Mobile & Ohio	125	Gondola	100,000	41	3	Steel	43,500	January	September	Amer. Car & Fdy.
Illinois Terminal	200	D. S. Box	100,000	40	6	Steel	45,400	March	December	Amer. Car & Fdy.
	75	Hopper	100,000	33	0	Composite	41,000	March	September	Amer. Car & Fdy.
Interstate	1,000	Hop. Bodies	100,000	..	..	Steel	...	June	....	Company Shops
Lehigh & New England	300	Hopper	100,000	33	0	Steel	39,400	January	Dec.-Jan. '45	Bethlehem
Lehigh Valley	15	Caboose	......	24	4 3/8	Steel	.....	August	June '45	Company Shops
	15	Caboose	......	24	4 3/8	Steel	.....	October	...	Company Shops
Maine Central	12	Air Dump	100,000	31	7½	Steel	68,000	April	March '45	Austin-Western
Minneapolis & St. Louis	500	D. S. Box	100,000	40	6	Steel	45,700	February	November	General American
	10	D. S. Box	100,000	40	6	Aluminum	38,500	June	December	Mount Vernon
	12	Caboose	......	25	0	Steel	38,800	May	Jan.-Mar. '45	Company Shops
	500	D. S. Box	100,000	40	6	Steel	45,400	October	July '45	General American
Missouri Pacific	500†	Hopper	140,000	40	8	Steel	47,300	Dec. '43	Oct.-Dec.	Pressed Steel
	15	Hopper	140,000	43	11¼	Aluminum	38,000	July	Mar. '45	Amer. Car & Fdy.
	300	D. S. Box	100,000	40	6	Steel	47,300	October	Apr. '45	Amer. Car & Fdy.
	200	D. S. Box	100,000	50	6	Steel	58,000	October	Apr. '45	Amer. Car & Fdy.
(For Gulf Coast Lines)	10	Hopper	140,000	40	8	Aluminum	48,600	July	Mar. '45	Amer. Car & Fdy.
	250	Box	100,000	40	6	Steel	47,200	October	Apr.-June '45	Amer. Car & Fdy.
	50	Box	100,000	50	6	Steel	58,000	October	Apr.-June '45	Amer. Car & Fdy.
(For Int'l Gr. Northern)	150	Box	100,000	40	6	Steel	47,200	October	Apr.-June '45	Amer. Car & Fdy.
	50	Box	100,000	50	6	Steel	58,000	October	Apr.-June '45	Amer. Car & Fdy.
Monongahela	50	Gondola	140,000	44	4	Steel	60,000	October	May-Oct. '45	Company Shops
Nashville, Chattanooga & St. Louis	200	Hopper	100,000	33	0	Steel	38,500	January	December	Pullman-Standard
New York Central	1,000	Box	110,000	40	6	Steel	46,900	May	November	Despatch Shops
	1,000	Box	110,000	40	6	Steel	46,900	May	Feb. '45	Despatch Shops
	1,000	Box	110,000	40	6	Steel	50,000	August	Apr. '45	Despatch Shops
	1,000	Box	110,000	50	6	Steel	57,000	June	Apr. '45	Amer. Car & Fdy.
	1,000	Hopper	110,000	33	0	Steel	41,500	June	Jan.-Feb. '45	Pressed Steel
	2,000	Box	110,000	50	6	Steel	.....	December	May-Aug. '45	Amer. Car & Fdy.
	2,000	Box	110,000	40	6	Steel	.....	December	July-Sept. '45	Despatch Shops
(For Pittsburgh & Lake Erie)	1,000	Gondola	140,000		..	Steel		November	Apr.-July '45	Despatch Shops
New York, Chicago & St. Louis	500	D. S. Box	100,000	40	6	Steel	46,500	December	Apr. '45	Ralston
New York, New Haven & Hartford	2,000	D. S. Box	100,000	40	6	Steel	45,600	February	Aug.-Nov.	Pullman-Standard
Norfolk & Western	500	D. S. Box	100,000	40	6	Steel	46,200	February	Oct.-Dec.	Company Shops
	20	Air Dump	100,000	..	..	Steel	.....	September	...	Austin-Western
Northern Pacific	30	Air Dump	100,000	31	7½	Steel	62,000	July	Apr. '45	Austin-Western
Pennsylvania	200†	D. S. Box	100,000	50	6	Steel	54,100	Dec. '43	June	Company Shops
	300†	D. S. Box	100,000	50	6	Steel	57,500	Dec. '43	August	Company Shops
Reading	1	Gondola	140,000	52	6	Steel	55,400	April	September	Bethlehem Steel
St. Louis-San Francisco	50	Cov. Hopper	140,000	29	3	Steel	54,800	October	Feb. '45	Company Shops
Seaboard Air Line	500	Box	100,000	..	..	Steel	.....	December	....	Pullman-Standard
	300	Flat	100,000	..	..	Steel	.....	December	...	Bethlehem
Southern	1,486	Gon. Bodies	100,000	40	6	Steel	41,000	June	1945	Pullman-Standard
Toledo, Peoria & Western	50	Box	100,000	..	..	Steel		December		Pullman-Standard
Wabash	600	Gon. Bodies	100,000	41	6	Steel	43,900	April	Feb.-Aug. '45	Company Shops
Western Maryland	362	Gon. Bodies	100,000	48	0	Steel	.....	August	Mar. '45	Bethlehem
	100	Box	100,000	..	..	Steel	.....	December	July '45	General American

† 1943 totals have been adjusted to include these cars which were not reported last year.

Purchaser	No.	Class	Capacity	Length ft. in.	Construction	Weight	Date of Order	Date of Delivery	Builder
Western Pacific	100	Gondola	140,000	52 6	Steel	62,800	May	Mar. '45	Mount Vernon
	350	D. S. Box	100,000	40 6	Steel	45,000	March	Jan. '45	Mount Vernon
Wheeling & Lake Erie	500	Gondola	100,000	41 6	Steel	43,000	April	Jan.-Feb. '45	Bethlehem
	500	D. S. Box	100,000	40 6	Steel	45,150	April	December	Ralston

Industrial and Private Car Line Orders—For Service in the United States

Purchaser	No.	Class	Capacity	Length ft. in.	Construction	Weight	Date of Order	Date of Delivery	Builder
American Refrigerator Transit ..	100	Refrigerator	80,000	.. ..	Steel	.....	February	....	Company Shops
	300	Refrigerator	80,000	.. ..	Steel	.....	June	....	Company Shops
American Steel & Wire Co.	4	Air Dump	180,000	.. ..	Steel	.....	August	....	Austin-Western
Anchor Petroleum Co.	5	Tank	10,500g	37 0	Steel	68,500	March	December	Amer. Car & Fdy.
Bethlehem Steel Co. (Sparrows Point)	25	Flat	140,000	36 0	Steel	.....	July	Feb. '45	Bethlehem
Buffalo Electro Chemical Co.	1	Tank	4,000g	24 8⅜	Aluminum	32,500	January	October	Amer. Car & Fdy.
Cardox Corp.	7	Tank	......	.. ..	Steel	.....	January	August	General American
	3	Tank	......	.. ..	Steel	.....	February	September	General American
	2	Tank	......	.. ..	Steel	.....	March	September	General American
Carnegie-Illinois Steel Corp.	8	Air Dump	100,000	.. ..	Steel	.....	November	....	Austin-Western
Celanese Corp.	20	Tank	......	.. ..	Steel	.....	October	Apr.-Oct. '45	General American
Cities Service Oil Co.	15	Tank	10,500g	37 0	Steel	65,000	October	Apr. '45	Amer. Car & Fdy.
	15	Tank	10,500g	.. ..	Steel	.....	October	Apr. '45	General American
Colorado Fuel & Iron	15	Air Dump	100,000	.. ..	Steel	.....	April	....	Austin-Western
Consolidated Chemical Industries	6	Tank	10,000g	34 1¼	Steel	47,200	October	May '45	Amer. Car & Fdy.
Commonwealth Edison	4	Air Dump	100,000	.. ..	Steel	.....	January	....	Austin-Western
Crossett Chemical Co.	2	Tank	8,000g	.. ..	Steel	.....	September	Mar. '45	General American
Defense Plant Corp. (Rubber Reserve)	150	Tank	11,600g	38 10½	Steel	61,800	January	October	Amer. Car & Fdy.
Diamond Alkali Co.	1	M. U. Tank	80,000	.. ..	Steel	33,500	February	February	Amer. Car & Fdy.
DuPont de Nemours, E. I. & Co.	2	Tank	8,200g	.. ..	Steel	.....	January	August	General American
Gas Oil Products	2	Tank	11,000g	38 10½	Steel	69,000	January	September	Amer. Car & Fdy.
General American Transportation	10	Refrigerator	......	.. ..	Steel	.....	September	Apr. '45	General American
	5	Tank	......	.. ..	Steel	.....	June	Jan. '45	General American
Hooker Electro Chemical Co.	10	Tank	10,000g	.. ..	Steel	.....	September	May '45	General American
Inland Steel Co.	20	Flat	180,000	40 0	Steel	66,000	February	November	General American
Jewett & Sherman Co.	1	Tank	100,000	.. ..	Steel	.....	November	1945	Haffner-Thrall
Jones & Laughlin Steel Co.	50	Gondola	140,000	40 0	Steel	65,300	May	Jan. '45	Amer. Car & Fdy.
Linde Air Products	21	Box	140,000	40 7⅝	Steel	108,500	January	August	General American
	35	Box	140,000	40 7⅝	Steel	108,500	February	August	General American
Midland Electric Coal Corp......	3	Air Dump	100,000	30 7⅝	Steel	64,000	March	December	Pressed Steel
Michigan Limestone & Chemical	20	Air Dump	154,000	41 1	Steel	76,000	September	Apr. '45	Pressed Steel
National Tube Co.	5	Gon. Bodies	100,000	.. ..	Steel	.....	June	Dec. '45	Haffner-Thrall
	30	Hop. Bodies	140,000	.. ..	Steel	.....	June	....	Haffner-Thrall
Pacific Fruit Express	500	Refrigerator	80,000	40 3⅛	Steel	53,800	May	Jan.-Mar. '45	General American
	500	Refrigerator	80,000	40 3⅛	Steel	55,000	May	Mar.-Apr. '45	Mount Vernon
	2	Refrigerator	80,000	39 0	Composite	57,000	September	July-Aug. '45	Consolidated Steel
Phillips Petroleum Co.	3	Tank	10,500g	37 0	Steel	68,000	January	March	General American
Public Service of Indiana	2	Air Dump	100,000	30 7⅝	Steel	63,800	August	Apr. '45	Pressed Steel
	1	Air DumpBod.	30 cu.yd.	..	Steel	.....	August	......	Pressed Steel
Republic Tank Car Co.	2	Tank	10,500g	37 0	Steel	68,500	January	October	Amer. Car & Fdy.
Sheffield Steel Co.	5	Slag	200,000	38 0	Steel	65,500	October	Apr. '45	Mount Vernon
Shippers' Car Line	10	Tank	8,000g	34 4	Aluminum	48,000	January	December	Amer. Car & Fdy.
	10	Tank	10,500g	37 0	Steel	67,500	March	September	Amer. Car & Fdy.
	8	M. U. Tank	80,000	42 4⅛	Steel	53,400	July	December	Amer. Car & Fdy.
	9	Tank	10,000g	34 1¼	Steel	60,000	September	Apr. '45	Amer. Car & Fdy.
	20	Tank	7,000g	29 3⅛	Steel	42,200	October	Apr. '45	Amer. Car & Fdy.
Standard Oil Co. of N. J.	8	Tank	5,500g	.. ..	Steel	.....	August	May '45	General American
Tennessee Coal, Iron & R. R.....	10	Air Dump	140,000	40 0	Steel	82,300	September	May '45	Pressed Steel
Timken Roller Bearing Co.	30	Gondola	140,000	40 4	Steel	56,200	June	Jan. '45	Amer. Car & Fdy.
Tin Processing (Metals Reserve)	1	Tank	12,000	36 11	Steel	51,300	August	Apr. '45	Amer. Car & Fdy.
Union Carbide & Carbon	1	Hopper	100,000	33 0	Steel	39,800	April	December	Amer. Car & Fdy.
U. S. Sugar Corp.	50	Gondola	60,000	37 4	Composite	31,000	March	Feb. '45	Magor Car
Warren Petroleum	7	Tank	100,000	37 0	Steel	68,500	March	December	Amer. Car & Fdy.
Western Contracting Corp.	2	D. C. Flat	250,000	55 6	Steel	143,000	November	...	Greenville
Western Food Products	1	Tank	100,000	.. ..	Steel	.....	September	1945	Haffner-Thrall
Western Pennsylvania Power ...	3	Air Dump	......	.. ..	Steel	.....	June	Jan. '45	Pressed Steel
Wierton Steel Co.	25	Flat	......	.. ..	Steel	.....	February	July-Aug.	General American
Youngstown Sheet & Tube Co...	1	Cinder Pot	200,000	31 6	Steel	62,000	April	November	Pressed Steel

United States—Export

Purchaser	No.	Class	Capacity	Length ft. in.	Construction	Weight	Date of Order	Date of Delivery	Builder
Anglo-Mexican Petroleum Co. (Brazil)	2‡	Tank	6,000g	.. ..	Steel	.....	August	June '45	Gregg Company
Carlos de Britto & Cia Brazil....	4‡	Tank	6,000g	.. ..	Steel	.....	August	May '45	Gregg Company
Chilean State Rys	250	Gondola	110,000	.. ..	......	.....	July	*	Pressed Steel
Cia Agricola e Industrial Magalhaes, Brazil	15	Cane	44,000	.. ..	......	.....	November	May '45	Pressed Steel
Cia Engenho Central de Quissama, Brazil	10	Cane	44,000	.. ..	......	.....	November	May '45	Pressed Steel
Daniel Vela, Mexico	10	Tank	10,500g	.. ..	Steel	.....	February	May '45	General American
Department Nacional de Estradrades de Ferro, Brazil	750	Box	79,200	.. ..	......	.....	November	....	Pressed Steel
	250	Gondola	79,200	.. ..	......	.....	November	...	Pressed Steel
F. C. Ambalena-ibague Ry, Colombia	20	S. S. Box	55,100	32 8½	Steel	28,800	June	May '45	Amer. Car & Fdy.
Ferrocarril de Antioquia, Colombia	48	Gondola	77,100	40 6	Steel	33,800	July	*	Amer. Car & Fdy.
	40	Flat	30,000	40 6	Steel	32,000	October	*	Amer. Car & Fdy.
Guayaquil & Quito, Ecuador ...	3	Tank	60,000	29 2½	Steel	28,500	March	May '45	Amer. Car & Fdy.
	2	Tank	60,000	29 2½	Steel	28,500	October	*	Amer. Car & Fdy.
	10	Box	44,800	33 7⅛	Steel	25,500	October	*	Amer. Car & Fdy.
	32	Box	66,000	42 0	Steel	21,940	June	June '45	Pressed Steel
	15	Box	66,000	42 0	Steel	22,170	June	June '45	Pressed Steel
Huancayo-Huancavelica, Peru ..	20‡	Flat	40,000	.. ..	Steel	.....	July	Mar. '45	Gregg Company
Institute do Acucar e de Alcool, Brazil	25‡	Tank	6,155g	.. ..	Steel	.....	August	May '45	Gregg Company
	10‡	Tank	4,050g	.. ..	Steel	.....	August	May '45	Gregg Company
Leopoldina Ry., Brazil	50	Gondola	40,000	.. ..	Steel	.....	April	Mar. '45	Amer. Car & Fdy.
Mexican Government Ry.	4	Air Dump	80,000	21 6	Steel	51,600	June	June '45	Pressed Steel
Mogyana Railway Co., Brazil ...	150	S. S. Box	79,350	40 6	Steel	29,385	October	June '45	Pressed Steel
National Steel Industry of Brazil	80	Gen. Service	120,000	.. ..	Steel	.....	October	1945	Pullman-Standard
	170	Ore	150,000	.. ..	Steel	.....	July	1945	Pullman-Standard
North-Western Ry. of Brazil ...	200	S. S. Box	79,350	40 6	Steel	29,385	October	June '45	Pressed Steel
Paulista Ry., Brazil	500	Box	88,000	36 9	Steel	34,054	April	1945	Pullman-Standard
Petroleos Mexicanos	4	Tank	10,000g	.. ..	Steel	.....	August	*	General American

* Reported not authorized for building by War Production Board.
‡ Subcontracts for building by American companies not yet awarded.

Purchaser	No.	Class	Capacity	Length ft. in.	Construction	Weight	Date of Order	Date of Delivery	Builder
Sociedade Anonyma Agricola Santa Luiza, Brazil	5	Cane	44,000	.. ..	.....	.....	November	May '45	Pressed Steel
Sorocabana Ry., Brazil	500	S. S. Box	79,350	40 6	Steel	29,385	June	Apr. '45	Pressed Steel
	1,000	S. S. Box	79,350	40 6	Steel	29,385	October	Apr.-June '45	Pressed Steel
Tropical Oil Co., Colombia	2	Tank	6,000g	29 1½	Steel	34,000	March	Jan. '45	Amer. Car & Fdy.
	2	Tank	6,000g	29 1½	Steel	31,700	March	Jan. '45	Amer. Car & Fdy.
Cia Usina Outeiro, Brazil	10	Cane	44,000	.. ..	......	....	November	May '45	Pressed Steel
Usino Sao Joao, Brazil	10	Cane	44,000	.. ..	......	....	November	May '45	Pressed Steel
U. S. Steel Export Co., Uruguay	1	Well	121,000	55 3	Steel	82,760	March	August	Pressed Steel
Victoria & Minas, Brazil	100	Flat	66,000	35 3	Steel	25,464	March	November	Pullman-Standard

Canada

Purchaser	No.	Class	Capacity	Length ft. in.	Construction	Weight	Date of Order	Date of Delivery	Builder
Canadian Car & Foundry Co.	25	Flat	100,000	52 0	Steel	44,900	March	July	Can. Car & Fdy.
Canadian National	250	Ore	100,000	.. ..	Steel	40,400	February	October	National Steel
	1,500	D. S. Box	100,000	40 6	Steel	.....	November	1945	National Steel
	450	Box	80,700	40 6	Steel	43,300	1944	July	Eastern Car
Canadian Pacific	140	Refrigerator	100,000	40 0	Steel	64.900	January	September	National Steel
	500	Gondola	140,000	52 6	Steel	54,300	January	December	National Steel
	300	Hopper	140,000	40 8	Steel	48,800	January	Dec.-Jan. '45	National Steel
	200	Refrigerator	100,000	40 0	Steel	64,900	July	1945	National Steel
	1,000	D. S. Box	100,000	40 6	Steel	45,600	January	October	Can. Car & Fdy.
	100	Hopper	140,000	40 8	Steel	48,000	January	November	Can. Car & Fdy.
	750	D. S. Box	100,000	40 6	Steel	.....	July	1945	Can. Car & Fdy.
	200	Gondola	150,000	52 6	Steel	54,300	August	1945	Eastern Car
	100	Hopper	150,000	40 8	Steel	48,800	January	November	Eastern Car
	50	Caboose		28 3	.....	40,000	January	September	Company Shops
Dept. Munitions & Supply	1,600	Gondola	48,000	19 6	Steel	.....	November	1945	Can. Car & Fdy.
	4,000	Box	48,000	23 6	Steel	.....	November	1945	Can. Car & Fdy.
	800	Flat	110,000	45 8	Steel	43,900	May	Feb. '45	Can. Car & Fdy.

supply industry. Lightweight cars built of strong alloy steels or aluminum alloy on trucks designed for high speeds, with improved construction features, braking and better protection of lading, urge the railroads to spend in the interest of technological progress and economy and will influence the volume of new purchasing as compared with rebuilding programs.

If national production attains the high level predicted, the accumulation of old age, deferred maintenance, accelerated wear and tear and obsolescence, when considered with the abnormally low current expenditures for rolling stock due to W. P. B. restrictions, the improved technologies developed by the war and the strengthened resources and cash position of the railroads, all indicate that new buying and building in the post-war period could easily reach the volume estimated. The rehabilitation requirements of Europe, the industrialization forecast for Latin America and the new railway construction programs of China might well add a huge export market for American builders.

The *Railway Age* cannot guarantee the listing of orders to be complete or the statistical accuracy of the production figures. However, it is believed that such omissions as occur will be found to be relatively small and unimportant, and will not vitiate the value of the figures, particularly with respect to comparisons with preceding years.

The appended list of orders was compiled from information furnished to the *Railway Age* by railroads, private car lines, and other purchasers of cars in response to requests for this information. Data thus compiled were then checked against lists of orders supplied by car builders. Production figures were secured in response to requests to freight car builders. As in former years, the *Railway Age* is indebted to the American Railway Car Institute for assistance in making available reports of companies affiliated with that organization.

Passenger Car

(*Continued from page 96*)

roads, which was checked against lists of orders received from car builders, these latter being made available through the courtesy of the American Railway Car Institute. Included in the text herein are comparative tables showing the number of passenger-train cars ordered and built in the 1929-1944 period.

Reliable trade estimates of the volume of orders and building to be expected when government restrictions are lifted range up to 2,000-3,000 cars annually for a five-year period, i.e., 10,000-15,000 cars. For a period comparable to that expected when the war ends, these sources point to the 1920's when well over 2,000 cars per year were ordered until 1930, or to the ten years, 1908-1917, when the railroads ordered an average of about 2,800 passenger-train cars annually. Orders for coaches and Pullman-type cars particularly are expected to increase.

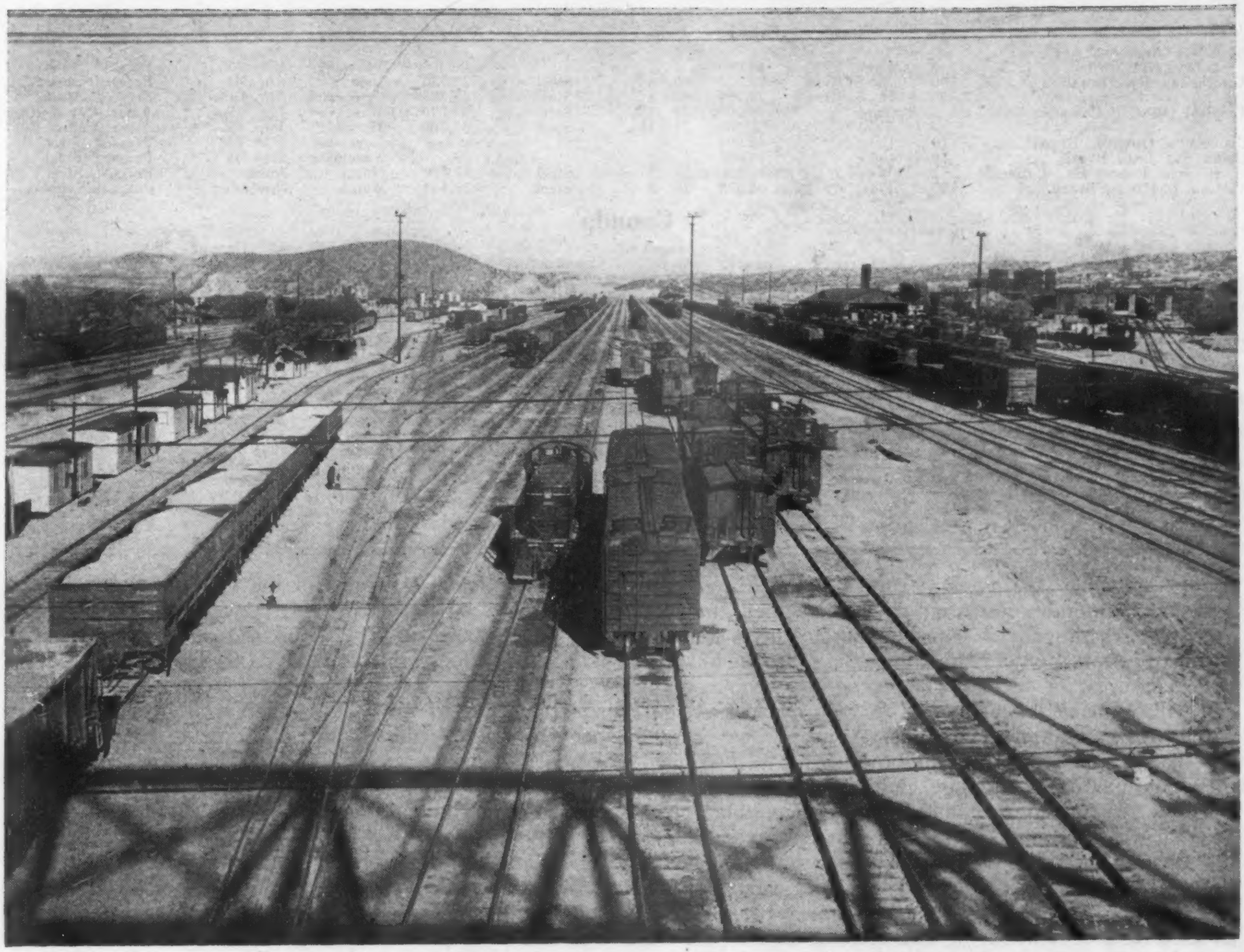
The modern lightweight streamliners developed since 1930, which the railroads had started to install when the war began, have rendered obsolete a great percentage of older cars both from the standpoint of operating economy and customer appeal. War time deferred maintenance, the current rapid depreciation of cars, the improvements in passenger car trucks and air conditioning, the revolution in interior arrangements and the important developments in construction materials and techniques taught by the war, all press for the replacement of outmoded equipment.

Both Incentive and Wherewithal

In the immediate post-war years, the railroads should have the financial resources necessary to rehabilitate their passenger carrying plant and the incentive to do so. Prewar experience indicates that the passenger transportation market is increasing and that all principal forms of transportation—the private automobile, the highway bus, the air lines and the railroads—can expect to increase their total of such business handled.

The industry is cognizant of the competitive conditions it must face. Certainly the railroads are determined and confident of their ability to hold their share of post-war passenger traffic. Railroads that hitherto have not operated streamlined trains have indicated their intention of doing so. Those now operating such trains have reported their decision to buy more—in some cases up to the limit of their buying power. Reduced passenger fares plus fast, frequent and comfortable modern streamline coach service will be extended.

Given a growing total passenger transportation market, and ingenuity on the part of the car manufacturer in designing the type of new streamlined trains that will elicit a demand from the ultimate consumer, the passenger traveler, the size of the post-war market for passenger cars could easily reach the 10,000-15,000 forecast.



New Yard Construction and Enlargement of Existing Yards Were Given Major Attention in 1944.

war shapes CONSTRUCTION

Most new projects in 1944 sought to facilitate assembly and dispatch of trains and to expedite movement between terminals

By GEORGE E. BOYD
Associate Editor

Construction activities during 1944 were hampered by shortages of labor and by difficulties in the procurement of materials, to such an extent that many needed improvements could not be made. However, a large volume of construction of those items that were needed imperatively to facilitate the movement of a record traffic were made during the year, to insure that no important military supplies or equipment would be delayed by reason of conditions that threatened their deliveries. This article lists all construction projects approximating or exceeding $100,000.

MORE than in any year since the present conflict started, the character of railway construction in 1944 gives evidence of the effect of the war and of its demands upon transportation facilities, although the trend toward certain types of work has been apparent ever since our entry into the war. These demands have grown out of the heaviest traffic the railways have ever carried, coupled with the requirement that it be moved dependably and expeditiously, to insure that no military activity on our far-flung fighting fronts will be delayed or cramped by failure to receive needed supplies.

Obviously, the requirement for either dependable or expeditious movement of traffic could not be met with obsolete or inadequate facilities, of which there were many and with which every railway was afflicted, and still is, despite a considerable volume of construction intended to remove these handicaps. Among the reasons why this condition prevailed was that expansion of facilities for expediting train movements practically ceased during the years that succeeded the debacle of 1929, while drastic changes in operating methods, which were put into effect during the same period, tended still further to make many facilities obsolete. In addition, most of the existing facilities had been designed to handle far less

Miles of Main Track Built in the United States in 1944

State	Number of companies building	First track	Second track	Third track	Fourth track	Total
Alaska	1	12.40	....	....	....	12.40
Florida	1	7.00	....	....	....	7.00
Georgia	1	2.43	....	....	....	2.43
Illinois	2	0.60	1.96	....	....	2.56
Iowa	1	1.81	....	....	....	1.81
Kentucky	3	31.81	7.70	....	....	39.51
Maine	1	....	10.60	....	....	10.60
Maryland	1	....	....	8.85	....	8.85
Missouri	1	....	1.87	....	....	1.87
Montana	1	....	9.86	....	....	9.86
New Mexico	1	....	1.25	....	....	1.25
North Carolina	2	15.30	4.85	....	....	20.15
North Dakota	1	....	13.00	....	....	13.00
Ohio	1	....	1.14	0.08	0.23	1.45
Oklahoma	1	7.15	....	....	....	7.15
Pennsylvania	2	1.18	0.82	6.14	....	8.14
South Dakota	1	....	0.93	....	....	0.93
Texas	1	8.82	....	....	....	8.82
Utah	1	....	7.26	....	....	7.26
Washington	1	12.67	....	....	....	12.67
West Virginia	2	16.82	....	....	....	16.82
Wyoming	1	3.08	....	....	....	3.08
Total		121.07	61.24	15.07	0.23	197.61

traffic than was thrust upon them suddenly by war conditions.

Obsolescence Always Accruing

Even under the most favorable circumstances—when money, materials and men are readily available—railway facilities suffer from a high rate of obsolescence. When this tendency is accompanied by an almost complete cessation of revision and expansion of these facilities as they approach the last stages of usefulness, and by radical changes in operating methods, conditions favorable to the expeditious movement of traffic deteriorate still more rapidly than they should with the facilities under normal use. This describes the situation as it existed at the beginning of the rise in traffic, which marked the opening of hostilities on our part, at which time more railway facilities than ever before were either obsolete or inadequate for other reasons to meet the demands that were to be made upon them, which have grown more insistent month by month.

Although earnest endeavor was made to overcome these deficiencies, and many items of construction that were needed badly have been carried out year by year since 1941, both the volume of traffic and efforts to expedite its movement, kept well in advance of the improvements that were made to the fixed property, so that conditions with respect to obsolescence and inadequacy of many of the facilities that were being used in the making up and dispatching of trains were still more aggravated at the beginning of 1944 than they were a year earlier.

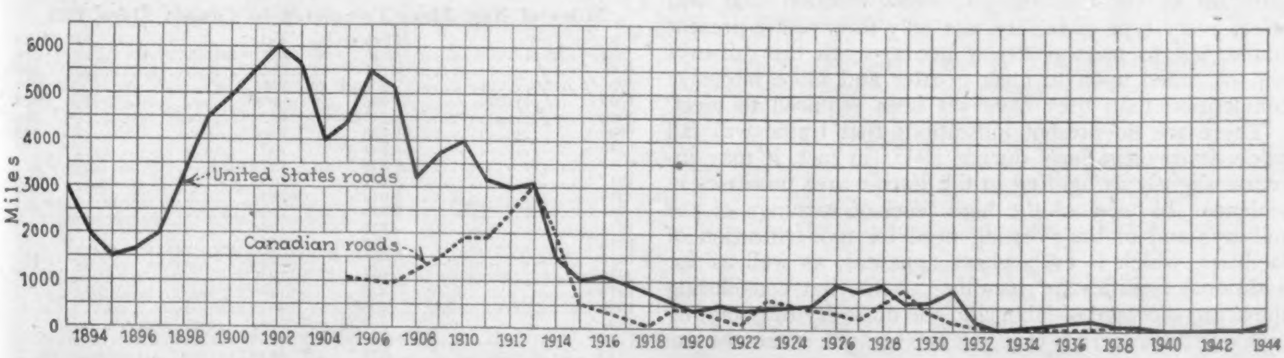
For several years there has been an increasing tendency to put aside other types of construction in favor of those projects that affect more directly the assembly and dispatch of trains, and the servicing of locomotives to get them back into road service in minimum time and to facilitate their movement on the road. In addition, major attention has also been given to the improvement and enlargement of shops and power houses, to provide larger and more modern facilities for repairing locomotives and cars. Like many other items of the fixed property, bridges were quite generally neglected during the decade following 1929. However, cars and locomotives continued to increase in weight and, since about the middle of this decade, trains have been operated at speeds that were not even considered at the beginning of the period. The result has been that, with the unexpected rise in traffic and the generally shortened schedules, many bridges have become inadequate to carry the increasing loads. While some of these structures have been strengthened and retained in service, an unusual number, compared with recent years, have been replaced, the cost of this work under way and completed during 1944 aggregating more than $25,000,000.

Enlarging Yards

In pursuance of this objective of speeding traffic, much attention was given during the year to the enlargement and rearrangement of yards and to the construction of new yards. Projects under this category involving expenditures approximating $20,000,000 were either under way or completed during the year, and the cost of individual projects ranged from $100,000 to $1,500,000. Likewise, engine terminal projects totaling almost $10,000,000 were completed or in process of completion at the end of the year. Although shops are not involved directly in speeding traffic, they are of equal importance in its steady flow, for they keep locomotives and cars in repair. For this reason, construction activities in 1944 included expenditures of more than $10,000,000 for shops and incidental facilities.

Various types of construction intended to expedite the movement of trains on the road, including the installation of automatic block signals, of centralized traffic control, of new interlockings or the replacement of existing ones, and the extension or rearrangement of additional passing sidings, which were estimated to cost approximately $20,000,000, were under construction or completed in 1944. Fuel and water stations, important factors in keeping trains moving regularly, were included in many of the budgets and, while most of them were of moderate cost, many others were of more ambitious proportions, so that approximately $4,500,000 were spent on their improvement.

While the various forms of construction that have been mentioned by no means exhaust the list of work done during the year, the number and importance of other projects were far more limited than at any time during the last quarter century, except at the depth of the depression. Some of the reasons for this were lack of man-power to carry out any but the most pressing items of construction; inability to obtain materials, except for work of urgent importance; and a desire to concentrate



Mileage of New Lines Constructed

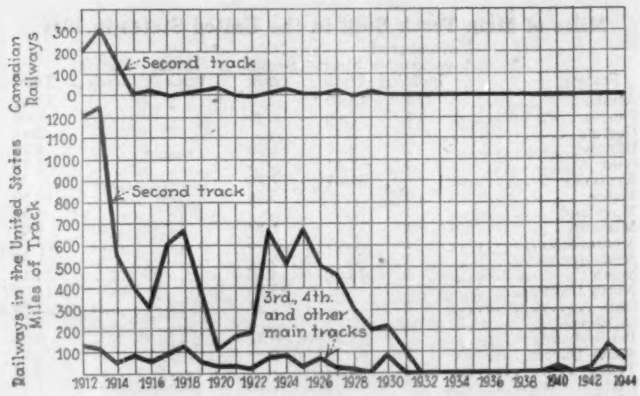
Miles of New Lines Completed in the United States Since 1830

Year	Miles	Year	Miles
1830	40	1887	13,081
1831	99	1888	7,066
1832	191	1889	5,707
1833	116	1890	5,739
1834	214	1891	4,620
1835	138	1892	4,648
1836	280	1893	3,024
1837	348	1894	1,760
1938	453	1895	1,420
1839	386	1896	1,692
1840	491	1897	2,109
1841	606	1898	3,265
1842	505	1899	4,569
1843	288	1900	4,894
1844	180	1901	5,368
1845	277	1902	6,026
1846	333	1903	5,652
1847	263	1904	3,832
1848	1,056	1905	4,388
1849	1,048	1906	5,623
1850	1,261	1907	5,212
1851	1,274	1908	3,214
1852	2,288	1909	3,748
1853	2,170	1910	4,122
1854	3,442	1911	3,066
1855	2,453	1912	2,997
1856	1,471	1913	3,071
1857	2,077	1914	1,532
1858	1,966	1915	933
1859	1,707	1916	1,098
1860	1,500	1917	979
1861	1,016	1918	721
1862	720	1919	686
1863	574	1920	314
1864	947	1921	475
1865	819	1922	324
1866	1,404	1923	427
1867	2,541	1924	579
1868	2,468	1925	644
1869	4,103	1926	1,005
1870	5,658	1927	779
1871	6,660	1928	1,025
1872	7,439	1929	666
1873	5,217	1930	513
1874	2,584	1931	748
1875	1,606	1932	163
1876	2,575	1933	24
1877	2,280	1934	76
1878	2,428	1935	45
1879	5,006	1936	93
1880	6,876	1937	148
1881	9,789	1938	38
1882	11,599	1939	58
1883	6,819	1940	26
1884	3,974	1941	54
1885	3,131	1942	74
1886	8,400	1943	56
		1944	121

particularly on those types of work that would be most conducive to the expeditious and dependable movement of trains.

Taken as a whole, however, the volume of construction in 1944 was somewhat disappointing and far less than was expected at the beginning of the year, since the budgets contained many items that were not even started and several of considerable magnitude that were started in previous years were closed down and completion was deferred until conditions were more favorable. While most of the projects that were under way during the year were of such character that their early completion was imperative, so many others that could not be undertaken are equally imperative in the long view, that the surface has yet scarcely been scratched, and there still remains the same need as before for a vast co-ordinated program of construction and reconstruction that will affect every type of facility, not only to expedite present traffic, but to meet post-war needs, when the railways will be called upon to meet greater and more intensive competition than they have yet been required to meet.

There are no present indications that traffic will fall below its present level during 1945; in fact, it may increase slightly as fighting in the Pacific area increases in violence. In view of the high level of earnings of the railways and of the pressing need for modernization of facilities, which is everywhere apparent, as well as for additional facilities for handling traffic, but considering the acute shortage of labor and the difficulty of obtaining many of the materials that will be required, it may be expected that construction activities for the coming year



Mileage of Multiple Tracks Constructed

will remain about at their present level, although there should be a considerable increase in projects of smaller magnitude that do not call for critical materials.

Since 1935, when federal appropriations for grade-crossing eliminations first became available, this class of construction has represented a major item in the programs of most of the roads in the United States, until this year, although in all but a few cases the work was carried out by or under the supervision of state highway officers, largely or wholly with funds provided through federal appropriations. In fact, a few small roads have spent more money on grade separations in this way than they had spent previously on all other forms of improvements since their original construction. In 1943 most of the grade-separation projects under way were completed, so that very few were carried over into 1944. In the latter year, however, partly through reduction in appropriations, partly through difficulty in the procurement of materials, and partly by reason of the labor shortage, grade-separation work dropped to the lowest level in nine years, with little prospect that there will be much of a revival of this activity during 1945.

While no important new lines were completed during 1944, there was an increase of more than 100 per cent in the mileage built, compared with the previous year, and the total for the year, 121 miles, was greater than for any year since 1937 and for any year between 1932 and 1937. It is also of more than passing interest that a number of new line projects are now under construction, with several others under survey.

During the 20-year period ending with 1924 the mileage of new lines completed annually varied from 314 in 1920 to 5,623 in 1906. The former was the smallest mileage recorded to that time since 1847, when the long period of railway expansion was beginning to get under way. In contrast, during the succeeding two decades to 1944, the largest mileage completed in any year was in

Miles of New Lines Completed in Canada Since 1904

Year	Miles	Year	Miles
1904	316	1925	414
1905	1,181	1926	335
1906	1,007	1927	310
1907	976	1928	723
1908	1,249	1929	841
1909	1,488	1930	385
1910	1,844	1931	250
1911	1,898	1932	121
1912	2,232	1933	0
1913	3,013	1934	1
1914	1,978	1935	2
1915	718	1936	1
1916	290	1937	0
1917	207	1938	101
1918	135	1939	1
1919	433	1940	2
1920	305	1941	1
1921	252	1942	1
1922	145	1943	3
1923	655	1944	0
1924	615		

1928, when 1,025 miles of new lines were placed in operation, and the smallest was the 24 miles completed in 1933, which still remains as the least mileage recorded for any year since the first railway was constructed in 1830.

It is of more than passing interest that the aggregate mileage constructed during the first period was 43,509, while that of the second period was only 6,356, for it is significant that the average mileage completed year by year during the earlier period was 2,175, while the annual average for the second two decades was only 318, or less than one-sixth of the earlier average. These figures show vividly that the days of large external development are past and that in the future, as at present, expenditures will be applied more and more for internal improvements and for the expansion of those facilities that will expedite the movement of traffic.

Much of the mileage of new lines completed in 1944 or still under construction at the end of the year is for the purpose of reaching undeveloped coal deposits or other resources, although several of these projects and a number of others that are still under consideration are in connection with line and grade improvements, a class of work that is likely to be expanded considerably in the post-war period. Two of the large projects of this character under way in 1944 were a change in line by the Southern Pacific in connection with the replacement of the viaduct across the Pecos river in Texas, and a similar change in line to provide the Chicago, Milwaukee, St. Paul & Pacific and the Chicago, Rock Island & Pacific, jointly, with a new entrance into Kansas City, Mo., including a new bridge over the Missouri river. No new lines were completed during the year in either Canada or Mexico.

Multiple track construction dropped almost 50 per cent from the previous year, with slightly more third track and only 0.23 mile of fourth track. The largest second-track project was on the Great Northern between Minot, N. D., and Des Lacs, 13 miles, and the second longest stretch was on the Boston & Maine, between North Berwick, Me., and Kennebunk. All of the third and fourth track built during the year was on the Pennsylvania.

During 1944 the construction of tracks to serve training camps, munition factories and other war industries, arsenals, air fields and fortified areas, fell off still further from the reduced activities of 1943, although some trackage of this character was completed and some was still under construction at the end of the year.

In general, the primary purpose of the construction undertaken in 1944, as well as most of that which was carried over from the previous year, was to facilitate the movement of cars through yards and of trains on the road, or to expedite the handling and servicing of locomotives at terminals. For this reason, additions to and rearrangement of yards and the construction of new yards; the construction, extension and relocation of passing sidings; the replacement of obsolete interlockings; the installation and improvement of automatic signals; the installation of centralized traffic control; and the applications of remote control to switches, were all important items in the improvement programs for the year. However, this major objective was not allowed to obscure consideration of other needs, such as the replacement of light or otherwise obsolete bridges, or to exclude the prosecution of a much wider variety of projects.

Following is a detailed report by roads of construction projects completed during 1944, or still in progress at the end of the year, the individual cost of which approximates or exceeds $100,000:

Railway Construction in the United States

(Figures in parenthesis indicate percentage of completion at the end of 1944)

Alaska

First Track: Whittier, Alaska, to Portage, 12.4 miles.

Important Work Undertaken: Construction of new line, Whittier, Alaska, to Portage, 12.4 miles, and construction of dock, yard and terminal facilities, Whittier, Alaska, $5,500,000 (100).

Alton & Southern

Second Track: East St. Louis, Ill., 1.96 miles.

Important Work Undertaken: Acquisition of land, nine additional classification tracks and installation of boiler water facilities, East St. Louis, Ill., $212,872 (100). Additional running track State Street to Collinsville Rd. and enlarge interchange facilities, East St. Louis, Ill., $107,766 (100).

Atchison, Topeka & Santa Fe

Second Track: Clovis, N. M., 1.25 miles.

Important Work Undertaken: Renewal of Bridge 69-B including raise of grade, Quenemo, Kan. (100). Relocating part of double track, Cardy, Mo., to Elmer (10). Renewal of Bridge 92-A over Pecos river, Melena, N. M. (100). Enlarging freight house, Albuquerque, N. M. (25). Concrete protection work, Cajon, Cal. (100). Enlargement of yard, Barstow, Cal. (100). Enlargement of yard, Bakersfield, Cal. (100). Enlargement of yard, Riverbank, Cal. (100). Extending yard tracks, Mormon, Cal. (100). Enlargement of yard, Richmond, Cal. (100). Enlargement of yard, Hobart, Cal. (100). New icing dock and facilities, San Bernardino, Cal. (100). Diesel locomotive repair facilities, Barstow, Cal. (25).

(Gulf, Colorado & Santa Fe). *Grade-Crossing Elimination:* Subway: Fort Worth, Tex. (80).

Important Work Undertaken: Relocating segment of main track, Ardmore, Okla. (100).

(Panhandle & Santa Fe) *Important Work Undertaken:* Extension of passing track, Clear Creek, Tex. (80). Relocation of segment of main track, Clear Creek, Tex. (108). Extension of passing track, Isaacs, Tex. (100).

Atlantic Coast Line

First Track: Bonita Springs, Fla., to Naples, 7 miles.

Important Work Undertaken: Additional three-story general office building, Wilmington, N. C., $220,868 (100).

Baltimore & Ohio

First Track: Cowen, W. Va., to Donaldson, 3.02 miles. Donaldson, W. Va., to Johnson Run, 7.60 miles.

Grade Crossing Eliminations: Overcrossings: E. Akron, Ohio, $260,000 (100). E. Columbus, Ohio, $850,000 (100).

Subway: Port Columbus, Ohio, $350,000 (100).

Track Elevation: Grant City to Bay Terrace, Staten Island, N. Y., $3,800,000 (20—completion indefinite).

Important Work Undertaken: Reconstruction of five bridges, Ohio River branch, $300,000 (100). Improved water facilities, Cowen, W. Va., $150,000 (100). Installation of industrial track, Panther Creek Jct., W. Va., $169,500 (100). Second track connection with Pittsburgh & Lake Erie, West Pittsburgh, Pa., $158,000 (100). Construction of bulkhead, Cleveland, Ohio, $102,000 (100). Improvements to Sycamore Slip, Cleveland, Ohio, $243,000 (80). Reconstruction of retaining wall, Struthers, Ohio, $135,000 (100). Revision of alinement to accommodate municipal improvements, Massillon, Ohio, $150,000 (99). Connection between Ohio and Toledo divisions, Chillicothe, Ohio, $223,500 (100). Reconstruction of bridge No. 172/75, Washington, Ind., $114,000 (10). Yard and engine terminal facilities, Decatur, Ill., $105,000 (100).

Boston & Maine

Second Track: North Berwick, Me., to Kennebunk, 10.6 miles.

Grade-Crossing Eliminations: Londonderry, N. H., Goffs Falls road closed by War Department in connection with the expansion of Grenier Field Air Base (100).

Important Work Undertaken: Diesel locomotive shop repair facilities, Mechanicsville, N. Y., $336,000 (100). Installation of one electrically operated interlocking to replace two mechanical interlockings including track changes, Manchester, N. H., $298,000 (100). Installation of interlocking, C. T. C. and changes in automatic signals including the installation of longer crossovers, East Portal, Mass., to Hoosick Jct., N. Y., $500,000 (5). Construction of second track, installation of signalling for reverse running in both directions in connection with C. T. C. New electric interlocking at South Portland, Me., North Berwick, Me., to Kennebunk, $325,000 (35).

Canadian National (Lines in the United States)

Important Work Undertaken: Reconstruction of overhead bridge, C. R. I. & P., Blue Island, Ill. (to be completed in 1945).

Central of Georgia

Grade Crossing Elimination: Overcrossings: Fort Mitchell, Ala., $30,000 (100). *Subways:* Macon to Camp Wheeler highway, Royster, Ga., $130,000 (100).

Important Work Undertaken: Revision of alinement and construction of new bridge over Cahaba river, Birmingham district, $225,000 (100).

Chesapeake & Ohio

First Track: Peaser Junction, W. Va., 4 miles. Westville, W. Va., 2.20 miles. From Millard, Ky., 19 miles.

Second Track: Kise, Ky., to Richardson, 6.09 miles. Lockwood, Ky., 1.61 miles.

New Road Under Construction: Near Westville, W. Va., 1.80 miles.

Grade Crossing Eliminations: Overcrossing: Dock, W. Va. (65).

Reconstruction of existing grade separation structure: Widening underpass, replacing timber trestle with steel span, Ivyton, Ky. (25).

Important Work Undertaken: Extending four tracks in westbound yard, Hinton, W. Va., $325,000 (45). Construction of spur track on Mill Creek to serve mine development, Mt. Hope, W. Va., $575,950 (35). Construction of spur track on Beaver Creek to serve mine development, Elkhorn City, Ky., $993,000 (65). Additional storage tracks in yards serving piers 10 and 12, Newport News, Va., $112,100 (100). 43 additional storage tracks and switching lead, Newport News, Va., $265,400 (100). Installation of traffic locking on crossovers and wye connection, Newport News, Va., to Oriana, $109,000 (100). Revision of alinement and grade, including replacement of stone arch over Rivanna river with steel bridge, Columbia, Va., $358,692 (100). Extension and rearrangement of existing tracks, and construction of additional tracks in yard, Gladstone, Va., $320,200 (100). Revision of grade and alinement and construction of Blue Ridge tunnel, 4,200 ft. long, Afton, Va., $1,530,200 (100). Extension and rearrangement of existing yard tracks, and construction of additional tracks, Peach Creek, W. Va., $234,500 (100). Extension of passing sidings, Christian, Va., Ferrol, North Mountain, Craigsville and Goshen, $134,700 (100). Reconstruction of Bridge 5129 over Big Sandy river, Big Sandy Jct., Ky., $1,351,000 (100). Construction of five additional tracks in westbound classification yard, Russell, Ky., $340,000 (100). Extension of five tracks in westbound receiving yard; extension of engine runaround underpass, Ferry street, and construction of 10 ft. arch; removal of station and office buildings; construction of pedestrian underpass; and rearrangement of shop facilities, Russell, Ky., $405,000 (100). Extension of sidings, installation of switchbacks and construction of additional shop facilities, Meadow Creek, W. Va., to Rainelle, $187,600 (100). Spur track up Rockhouse Creek to serve coal development, Man, W. Va., $1,101,000 (100). Construction of passing siding, Midkiff, W. Va., $135,450 (100). Spur track up Roach branch to serve coal development, Van, W. Va., $123,175 (100). Spur track up Caney Creek to serve coal development, Caney Creek, Ky., $116,000 (100).

Chicago & North Western

First Track: Shobon, Wyo., to Shoshoni, 2.99 miles. Illco, Wyo., 0.39 miles.

Important Work Undertaken: Reconstruction of docks, fenders, fender piles, carferry slips and coal dock slip, Manitowoc, Wis., $154,200 (100). Construction of new passenger station including platforms, driveways, coach tracks, Manitowoc, Wis., $152,550 (80). Reconstruction of 937 lin. ft. of bulkhead on north branch of Chicago river, Chicago, Ill., $126,000 (50).

Chicago, Burlington & Quincy

Grade Crossing Eliminations: Overcrossings: New Milford, Ill., $120,000 (100). Oregon, Ill., $75,000 (20). Burlington, Ia., $100,000 (100). East of Pacific Jct., Ia., $60,000 (100).

Important Work Undertaken: Zephyr train facilities in 14th St. yard, Chicago, Ill., $259,550 (75). Diesel locomotive maintenance facilities, W. Burlington, Ia., $454,152 (40). Diesel locomotive maintenance facilities, Clyde, Ill., $462,978 (10). Diesel locomotive maintenance facilities, Denver, Colo., $521,004 (5). Extension of passing sidings, Lincoln, Neb., to Akron, Colo., $334,393 (80). in connection with C. T. C., Lincoln, Neb., to Hastings, $538,502 (85). Rearrange and enlarge yard, LaCrosse, Wis., $397,662 (70). Rearrange and enlarge 31st Street yard, Denver, Colo., $504,357 (40) New hump yard, Lincoln, Neb., $1,312,338 (95). Extension of passing sidings, Edgemont, S. D., to Huntley, Mont., $121,485 (100). Improvements to shop building, Havelock, Neb., $241,000 (100).

Chicago Great Western

Important Work Undertaken: Relining 920 feet of single track tunnel, Winston, Ill., more than $100,000 (100).

Chicago, Milwaukee, St. Paul & Pacific

First Track: Eatonville, Wash., to Elbe, 12.67 miles. At Kittredge, Ill., 0.60 miles.

Second Track: At Milbank, So. Dak., 0.93 miles.

Grade Crossing Eliminations: Overcrossings: Seattle, Wash., joint with Northern Pacific, Oregon Washington Ry. & Navigation Co., and Pacific Coast, $150,000 (100). Spokane St., Seattle, Wash., joint with Northern Pacific, Oregon Washington Ry. & Navigation Co., Union Pacific, Great Northern, and Pacific Coast, $960,000 (100).

Subway: Two miles west of Birmingham, Mo., joint with Chicago, Rock Island & Pacific, $18,000 (100).

Important Work Undertaken: Relocation of main line and construction of bridge over Missouri river to provide new entrance to Kansas City, Birmingham, Mo., joint with Chicago, Rock Island & Pacific and Kansas City Southern, $3,500,000 (95). Revision of and additions to yard including additional engine terminal facilities, joint with Kansas City Southern, $666,000 (80). Track elevation, Church street to Garnett Place, Evanston, Ill., $245,000 (75). Relocation and elevation of main track above flood plain, Root river, Mound Prairie, Minn., $141,000 (95). Revision of alinement to reduce curvature; move station and water facilities to Lanark, Ill., $140,000 (80).

Chicago, Rock Island & Pacific

First Track: Colfax, Iowa, 1.81 miles.

New Road Under Construction: Perlee, Iowa, to Eldon, 22.76 miles. Birmingham, Mo., to Kansas City, Mo., 5.53 miles, including new bridge over Missouri river, $1,312,000 (85). New line to serve Shumaker Naval Ordnance Plant, Shumaker, Ark., $158,000 (100).

Grade-Crossing Eliminations: Overcrossings: Crossing to be eliminated by construction over Illinois river, Harvard street, Peoria, Ill., C. R. I. & P. portion, $40,000 (50, completion deferred). Roosevelt road, Little Rock, Ark., $70,000 (65, completion deferred). U. S. routes 81 and 66, El Reno, Okla., $201,000 (60, completion deferred).

Reconstruction of existing grade separation structures: Hampton road, Dallas, Tex., $10,000 (100).

Important Work Undertaken: Revision of alinement, 1.83 miles, Colfax, Iowa, $149,000 (100). Revision of alinement, 22.76 miles, Perlee, Iowa, to Eldon, $2,459,000 (100). Retirement and replacement of shop buildings, including rearrangement of shop facilities, 51st street shop, Chicago, Ill., $1,700,000 (5). Replacement of old shop buildings and facilities with new facilities, Cedar Rapids, Iowa, $317,000 (90).

New Line Under Survey: Paris, Iowa, to Centerville, relocation, 18.12 miles, (started).

Delaware & Hudson

Important Work Undertaken: Replacing and strengthening bridges, Saratoga, N. Y., to North Creek, $160,000 (100). New turntable and other engine terminal improvements, Binghamton, N. Y., $100,000 (100). Replace two steel bridges, Otego, N. Y., $249,000 (10).

Delaware, Lackawanna & Western

Grade-Crossing Eliminations: Overcrossings: Reconstruction of overhead crossing serving Norwich, North Norwich and North Norwich-Sherburne highways, Galena, N. Y. (60), completion deferred indefinitely.

Denver & Rio Grande Western

Second Track: Extension of second track, Dern, Utah, to Geneva, 5.80 miles. Midvale, Utah, to Gaddie, 1.46 miles.

Grade Crossing Eliminations: Overcrossing: 21st South st., Roper, Utah, $125,000 (100). Closing of vehicular crossing across Prospect interchange yard, 43rd avenue, Denver, Colo., and construction of timber overcrossing for pedestrians only; joint with Denver & Salt Lake, Chicago, Burlington & Quincy, and Colorado & Southern, $26,728 (100).

Important Work Undertaken: Construction of garage and office building for Motorway, Denver, Colo., $150,700 (100). Extension of passing sidings and installation of power switches, and installation of C. T. C., Fox Junction, Colo., to Orestod, 128 miles, $1,100,000 (50). New main line tunnel ½ mile long with appurtenances, under Continental divide, Tennessee Pass, Colo., $826,100 (45). Applying 6-in. additional ballast, (two projects) Bond, Colo., to Dotsero, 38 miles, $338,000 (100). Extension of two passing sidings and extension of second main track, 7,700 ft., American Fork, Utah, Riverton and Midvale, $148,100 (70). Improvements to enginehouse and incidental facilities, Salt Lake City, Utah, $138,700 (50). Extension of passing sidings and installation of power switches and installation of C. T. C., Grand Junction, Colo., to Agate, Utah, $276,700 (90).

Denver & Salt Lake

Important Work Undertaken: Construction of permanent bridge on new alinement and retirement of existing timber trestle, Mile Post 67.80 to Mile Post 68.00, $35,000 (100). Construction of new auxiliary main line, 1.4 miles in length, Tabernash, Colo., $142,000 (35). Extension of passing sidings and installation of power switches, and installation of C. T. C., Denver, Colo., to Orestod, Colo., $1,000,000 (entire expense to be borne by D. & R. G. W.) (40). Replacement of timber lining in tunnels 18, 19, 39 and 42, totaling 1,404 lin. ft., with steel and concrete lining, $325,000 (95).

Detroit, Toledo & Ironton

Grade Crossing Elimination: Subway: Access highway to Gate 10, Ford Motor Co., Dearborn, Mich., $500,000 (100).

East Broad Top Railroad

First Track: Alvan, Penna., to Mine No. 10, 1.18 miles.

Erie

Grade Crossing Elimination: Overcrossing: State Route S-3, Rutherford, N. J. (90).

Reconstruction of Existing Grade Separation Structures: Reconstruction of overhead bridge H-39.69, Southfields, N. Y., (59, completion deferred).

Important Work Undertaken: Relocation of one-half mile line, including diversion of channel of Delaware river, Long Eddy, N. Y. (100). Construction of new passenger station and freight house including rearrangement of tracks and platforms, Ashland, Ohio (98). Construction of Diesel locomotive service and repair shop and incidental facilities, Marion, Ohio (85).

Florida East Coast Railway

Important Work Undertaken: Facilities to serve State Farmers Market, including 1.61 miles of spur track, a runaround track 0.48 miles, two loading tracks 0.53 miles, a steel and concrete highway bridge, 22,200 sq. yd. of paved driveways, lighting facilities and milling office, Pompano, Fla., $114,000 (100).

Great Northern

Second Track: Minot, N. D., to Des Lacs, 13.0 miles.

Grade Crossing Elimination: Placing concrete pipe on overhead bridge, Tioga, N. D., $185 (100). Installation of culvert, Osseo, Minn., $525 (100). Installing fence netting on Jackson Street bridge, Seattle, Wash., $310 (100).

Reconstruction of existing grade crossing structures: 21st Street bridge, Superior, Wis., $11,200 (100). Second St., Minot, N. D., $12,200 (100). Overhead bridge 228, Wayzata, Minn., $2,500 (100). Overhead bridge 1.3, Glenwood Ave., Minneapolis, Minn., $15,800 (100). Overhead bridge, Hopkins Jct., Minn., $12,600 (100). Bridge 2.7, Glenwood Ave., Minneapolis, Minn., $13,200 (100). Overhead bridge, Ashby, Minn., $8,500 (100). Overhead bridge, Alexandria, Minn., $3,400 (100). Overhead bridge, Red Lake Falls, Minn., $1,650 (100). Overhead bridge, Belknap St., Superior, Wis., $5,500 (100). Overhead bridge, Osakis, Minn., $4,850 (100). Pave road under bridge, Snohomish, Wash., $300 (100). 21st St. viaduct, Superior, Wis., $9,000 (10). Overhead bridge 101.3, Stanchfield, Minn., $1,900 (100). Overhead bridge, 15th Ave.-14th St., Minneapolis, $66,000 (10). Reconstruction of overhead bridge, High St., Minneapolis, Minn., $109,000 (100). Overhead bridge, Belknap St., Superior, Wis., $7,000 (100). Rebuild bridge No. 16, Red Lake Falls, Minn., $4,865 (started). Central Ave. bridge, Great Falls, Mont., $29,500 (100). Como Ave. bridge, St. Paul, Minn., $38,000 (100). Oakes Ave. bridge, Everett, Wash., $7,900 (100). Bridge 30.7, Paynesville, Minn., $1,900 (100).

Important Work Undertaken: Additional ballast and 112-lb. rail, Palermo, N. D., to Manitou, $308,748 (100). Additional ballast and 112-lb. rail, Epping, N. D., to Avoca, $111,600 (100). Additional ballast and 112-lb. rail, Kremlin, Mont., to Beulow, $592,736 (95). Additional ballast and 112-lb. rail, Benson, Minn., to Hancock, $237,325 (100). Widen roadbed and apply additional ballast and 112-lb. rail, Cut Bank, Mont., to Blackfoot, $423,600 (75). Additional ballast and second hand rail, Dresen, N. D., to Hanah, $133,600 (100). Widening roadbed, applying additional ballast and laying 112-lb. rail, Espanola, Mont., to Waukon, $108,600 (100). Widening roadbed, applying additional ballast and laying second-hand rail, Geyser, Mont., to Moccasin, $229,000 (75). Widening roadbed and applying additional ballast, Spokane division, Washington, $121,700 (100). Additional yard facilities, Great Falls, Mont. $179,100 (100). Improvement to enginehouse, Whitefish, Mont., $147,800 (60). Construction of brick warehouse, U. S. Army, Seattle, Wash., $250,700 (100). New power house, St. Paul, Minn., $191,950 (75). Improvements to roadbed, Wolverton, Minn., to Finkle, $110,000 (100). Second main track, Minot, N. D., to Des Lacs, $185,750 (100). Revision of alinement, Red Eagle, Mont., to Belton, $1,440,000 (75). Revision of alinement, Bonners Ferry, Mont., $126,700 (100). Widen roadbed and apply additional ballast, Missabe division, $103,150 (60). Widen roadbed, apply additional ballast, Willmar division, $115,200 (100). Replacement of bridge 3.2, Fairview, N. D., $123,000 (10). Repairs to and straightening of bridges, Spokane division, $124,120 (100). Connecting passing tracks, Fortine, Mont., to Tobacco, $240,300 (started). Revision of alinement, Acme, Mont., to Collins, $116,000 (10). Revision of alinement, Camden, Wash., $300,000 (10). Diesel oil facilities, Minot, N. D., Havre, Mont., and Spokane, Wash., $146,840 (10). Diesel fuel oil facilities, Great Falls, Mont., and Laurel, Mont., $201,550 (10). Diesel shop and storehouse, Havre, Mont., $381,700 (15).

Replacement of boilers and providing facilities for direct steaming, Havre, Mont., $104,400 (started). Repairs to ore docks, Allonez, Wis., $753,-300 (25).

Illinois Central

Important Work Undertaken: Replacing train shed, Central station, Chicago, Ill., $229,500 (90). Additional tracks, crane runway and other facilities, car repair yard, Centralia, Ill., $118,560 (40). Replacement of bridge W326-3, Iowa river, Iowa Falls, Ia., $100,800 (100). Track to serve the Beech Creek Coal Co., Greenville, Ky., $249,880 (100). Relocation of main track in connection with constructing of Kentucky Dam by the T. V. A., Gilbertsville, Ky., $1,094,800 (100). Renewal of bridge over Yazoo river, Redwood, Miss., $783,010 (100). Additional tracks, Mays yard, New Orleans, La., $301,470 (100).

Louisville & Nashville

First Track: Dent, Ky., up Leatherwood Creek and Clover Fork Branch of Leatherwood Creek, 10.21 miles. Romney, Ky., to Powerfull, 2.60 miles.

New Road Under Construction: Millport, Ky., up Briar Creek, 3 miles.

New Road Under Survey: Drakesboro, Ky., 2.1 miles. Closplint, Ky., up Clover Fork of Cumberland river, 9.00 miles. Cornick, Ky., 2.34 miles.

Grade Crossing Eliminations: Overcrossing: Maryville, Tenn., $100,000 (started).

Subway: Dossett, Tenn., $100,000 (started).

Important Work Undertaken: Replacing 11,627 ft. of creosoted timber trestle approach to bridge over Ohio river, Henderson, Ky., $970,000 (started). Construction of pier and replacement of 304-ft. through truss span with a 350-ft. through truss span, Ford, Ky., $218,735 (100). Installation of centralized traffic control including changes in passing sidings, Catoma, Ala., to Sibert, $957,050 (100). Installation of centralized traffic control including changees in passing sidings, Lebanon Junction, Ky., to Sinks, $542,000 (12).

Massena Terminal

Important Work Undertaken: Spur track to serve Defense Plant Corporation, including bridge to cross Power canal, Massena, N. Y., $675,239 (100).

Missouri-Kansas-Texas

First Track: Pottsboro, Texas, to Sadler, 8.82 miles, $970,000.

Grade Crossing Elimination: Subways: Atoka, Okla., State Route 19, $129,000 (85).

Missouri Pacific

Second Track: Independence, Mo., to Elm Park, 1.87 miles.

New Road Under Construction: Hastings, Nebr., to Prosser, 13.14 miles.

Grade Crossing Eliminations: Overcrossings: Route 69, Wagoner, Okla., $75,000 (25, completion deferred).

Important Work Undertaken: Elimination of grade crossing with Gulf, Mobile & Ohio, by construction of overcrossing, Dupo, Ill., $65,000 (90). Applying additional tie plates to system lines, $134,000 (80). Enginehouse improvements, Dupo, Ill., $240,000 (100). Construction of bridge, Cache river, Cache, Ill., $162,000 (25). Revision of grade and alinement, Hilliard, Mo., $255,000 (100). Installation of C. T. C. including extensions to passing sidings and other track changes, Knobel, Ark., $471,000 (100). Installation of C. T. C. including extensions to passing sidings and other track changes, Gurdon-Texarkana, $400,000 (100). Rebuilding various bridges, Reader, Ark., $103,000 (5). Reconstruction of bridge 87, Yancopin, Ark., $548,000 (90). Revision of alinement and reconstruction of Bridge 105, Riverton, La., $649,000 (80). Raising main track above flood plane level, Boonville, Mo., and Cole, $610,000 (90). Raising track above flood plane, Pleasant Hill, Mo., Cole and Greenwood, Ark., $286,500 (100). Installation of lap sidings, Comiskey, Kan., $206,500 (25). Extension to tracks, Cora, Ill., $104,790 (100). Revision of alinement, Barretts, Mo., $315,000 (100).

(Gulf Coast Lines) Line change 6.2 miles, including 18,750 ft. of floodway bridge of reinforced concrete construction, over Morganza floodway, Krotz Springs, La., to Lottie, $2,500,000 (100).

Nashville, Chattanooga & St. Louis

First Track: V. S. 2289, Georgia, to V. S. 2417 + 15.5, 2.43 miles.

New Road Under Construction: Denver, Tenn., to Troy, 11.26 miles

Important Work Undertaken: Construction of Bridge 45.6 and revision of alinement, Atlanta division, Etowah river, $650,000 (100).

New York Central

Grade Crossing Elimination: Overcrossings: Relocation of highway and construction of overhead crossing, Post Creek, N. Y., $218,900 (100). U. S. Route 60, Reed, W. Va., $623,000 (100). Relocation of James road, and construction of overhead crossing, joint with B. & O. and Penna., Columbus, Ohio, $863,780 (100). Franklin Ave., Erie, Pa., joint with N. Y. C. & St. L., $397,300 (100).

Revision of alinement 3.25 miles to eliminate grade crossing, Herkimer, N. Y., $3,380,000 (100).

Relocation of Wood st., Porter, Ind., and Chesterton, $1,600 (100).

Important Work Undertaken: Revision of alinement to reduce curvature, and demolition of bridge over Erie canal, Canastota, N. Y., $322,000 (10). Signaling improvements including incidental track changes and installation of power switch machines, East Syracuse, N. Y., to Salina, $113,-000 (50). Construction of three-story brick building to provide sleeping quarters and restaurant facilities for engine and train crews, East Syracuse, N. Y., $210,000 (100). Widening existing concrete platform and steel canopy between west 60th st., and west 64th st. including track changes and additions, construction of office in terminal warehouse and of battery charging and checkers room on platform, 60th Street yard, N. Y., $150,000 (100). Reconstruction of tracks and reconstruction of bridges 306 and 307 over Kinderhook creek and Stockport creek, Stockport, N. Y., $131,500 (80). Freight transfer platform and canopy, extension of existing platform and canopy; new platform and canopy to connect foregoing platforms with outbound freight house, including incidental track changes and additions, Utica, N. Y., $123,500 (100). Additional track and signaling facilities, Wayneport, coaling plant, Wayneport, N. Y., $112,250 (70). Underpinning and extending piers and strengthening Bridge 216 over Cattaraugus Creek, Irving, N. Y., $489,000 (100). Reconstruction of arch, State Line, N. Y., $230,000 (100). Replacement of gravity coaling trestle with 1,700-ton mechanical coaling plant; three double-track wet-type cinder pits; replacement of 100-ft. turntable with one 120-ft. long; rearrangement of tracks and other facilities at engine terminal; installing water, coal and cinder handling facilities at Dille road for servicing through road power, Collinwood yard, Cleveland, Ohio, $1,040,000 (100). Reconstruction of mail building, Cleveland, Ohio, $134,500 (100). Replacement of timber trestles across Sandusky Bay with steel structure on concrete piers, includes drawbridge, Sandusky, Ohio, $1,250,000 (100).

(Cleveland, Cincinnati, Chicago & St. Louis) *Important Work Undertaken:* Replacement of engine terminal facilities destroyed by fire, Bellefontaine, Ohio, $1,000,000 (100).

(Michigan Central) *Grade Crossing Elimination:* Subways: Detroit Industrial Expressway, Dearborn, Mich., $1,100,000 (100). Detroit Industrial Expressway and Junction Yards branch, Dearborn, Mich., $440,000 (100). Middle Belt road, Inkster, Mich., $295,000 (100).

Overcrossing: Wllow Run Housing access road, Ypsilanti, Mich., $154,-000 (100).

Important Work Undertaken: Installation of one 100-ton and one 50-ton automatic electric drop tables; extension of five enginehouse stalls, Jackson, Mich., $190,000 (100). Extension of eight yard tracks and other incidental track changes, Jackson Jct., Mich., $180,000 (30).

New York, Chicago & St. Louis

Grade Crossing Elimination: Viaduct, joint with New York Central, New York, Chicago & St. Louis and Pennsylvania, Franklin Ave., Erie, Pa., $390,500 (100).

Important Work Undertaken: Extension of machine shop building, Conneaut, Ohio, $149,679 (60). Construction of six tracks in Blair yard, Fostoria, Ohio, $128,750 (100). Extension of Adgate passing track and installaton of switching lead, Lima, Ohio, $135,600 (10). Installation of C. T. C. including incidental track changes, North East, Pa., to Thornton Jct., $298,121 (50). Installation of C. T. C. including incidental track changes, Madison, Ohio, to Euclid, $208,075 (100). Raising main and yard track embankment, Cayuga, Ind., $152,900 (75). Replacement of girders, reinforcement of columns, and encasement of pier, Bridge 184.50, Cleveland, Ohio, $146,458 (100). Extension of enginehouse stalls and installation of 80-ton drop table, Conneaut, Ohio, $121,314 (80).

New York, New Haven & Hartford

Important Work Undertaken: Dormitory building for employees, New Haven, Conn., $180,000 (60). Teletype carrier and associated equipment, Maybrook, N. Y., and New Haven, Conn.; in addition, pneumatic tube system at Maybrook, $100,862 (2).

New York, Susquehanna & Western

Grade-Crossing Eliminations: Crossing vacated by municipalties, McCoy Road, Oakland, N. J. (100).

Relocation of Highways: Elimination of grade crossing by construction of marginal highway, East 39th St., Paterson, N. J., $6,000 (100).

Norfolk & Western

New Road Under Construction: Extension of Levisa branch in Kentucky, 8.60 miles.

Important Work Undertaken: Construction of 2.2 miles spur and 2,370 ft. of siding at coal mine extending Buchanan branch along Upper Elk Creek, $204,000 (100). Construction of storage yard involving six miles of track, Windsor, Va., $182,000 (100). Extension of middle passing sidings 1,851 ft., installation of remote control switches, including signals for operations in both directions, Elkhorn, W. Va., $120,000 (80). Extension of Levisa branch from Virginia-Kentucky state line to mouth of Big Creek, spur 2.25 miles up Big Creek, Levisa branch, $982,000 (50).

Northern Pacific Railway Company

Second Track: Laurel, Mont., to Park City, 7.47 miles. Helena, Mont., to Fort Harrison, 2.39 miles.

Important Work Undertaken: Second main track, new switching leads and ladder tracks in yard, including I-beam bridge and channel changes, Jamestown, N. D., $446,400 (10). Construction of 7-mile spur, including storage tracks, wye, siding, crossover and water station to serve new coal mine, Hazen, N. D., $342,000 (100). Addition to locomotive shop; construction of locomotive machine shop; two-story storehouse and shop office; boiler tube storage building, acetylene generating building and other incidental facilities, Livingston, Mont., $1,450,000 (100). New power plant and new journal packing bulding, Livingston, Mont., $315,000 (20). New single track main line tunnel, 2,850 ft. long with 800 ft. of open cut approach, Muir, Mont., $1,050,500 (80). New main line coaling and sanding facilities and incidental trackage, Kootenai, Idaho, $175,000 (30). New Diesel shop and storehouse facilities, Auburn, Wash., $426,000 (100).

Pennsylvania

Second Track: Harvey, Ohio, 1.14 miles.

Third Track: Bulger, Pa., to Dinsmore, 5.54 miles. Dinsmore, Pa., to Bertha, 0.60 miles. Oakington, Md., to Bush River, 8.85 miles. Columbus, Ohio, 0.08 miles.

Fourth Track: Columbus, Ohio, 0.23 miles.

Grade Crossing Elimination: Overcrossing: Lombard St., Baltimore, Md. (100).

Important Work Undertaken: Replacement of electro-mechanical interlocking machine by an electro-pneumatic machine, and replacement of wooden interlocking tower with brick tower, Princeton Jct., N. J. (100). Replacement of electro-mechanical interlocking machine by an electro-pneumatic machine and replacement of wooden interlocking tower with brick tower, Monmouth Jct., N. J. (100). Replacement of brick arch over street, with concrete arch; relining three arches with concrete and filling one brick arch, Grant St. and Poquessing creek, Torresdale, Pa. (100). Extension to bulkhead feight shed, south of Pier 78, North river, New York, N. Y. (100). Reconstruction of stock yards, low water deck, to replace facilities destroyed by fire, Jersey City, N. J. (90). Replacement of wood Howe truss transfer bridges with steel construction changing operating equipment from d-c. to a-c. to remove load restrictions, Jersey City, N. J. (50). Expansion of parcel room facilities and addition to the facilities of the Savarin buffet, east end of L. I. section, Pennsylvania Station, New York (90). Four new stores on south side of Long Island concourse, Pennsylvania Station, New York (7). Electrification of Track No. 1, North Point, Md., to Bengies (100). Extension of south connection from Port and installation of reverse signalling from Port to Creswell, Pa. (100). Additional track outward receiving and classification yard and "C" yard, Greenwich yard, Philadelphia, Pa. (100). Installation of automatic deluge and dry pipe sprinkler system between 15th and 16th streets under elevated railroad, Broad Street station, Philadelphia, Pa. (100). Additional main tracks and extension of northward siding, Havre de Grace, Md., to Bush river (100). Installation of car retardera, westbound classification yard, Enola, Pa. (95). Installation of transfer bridge and supporting yard, Greenwich yard, Philadelphia, Pa. (35). Engine servicing facilites, Ivy City, Washington, D. C. (100). Revision of alinement, southbound track and extension of middle platform, Wilmington, Del. (75). Ferry facilities and reconstruction of bulkhead, Cape Charles, Va. (90). Reconstruction of bridge 247.21, Gallitzin, Pa. (100). Two additional relay tracks for westbound trains in Pitcairn district west from East Pittsburgh, Pa. (45). Reconstruction of main tracks, Pittsburgh, Pa., to Etna (100). Extension of enginehouse, installation of 100-ton drop table and relocation of wheel lathe, Erie, Pa. (100). Construction of 3,100 ft. of concrete toe wall for bank protection, Cameron, Pa. (100). Construction of 2,970 ft. of concrete toe wall for bank protection, Sterling Run, Pa. (50). Improvement of enginehouse facilities, Conway, Pa. (100). Installation of 110-ft. turntable to replace 100-ft. turntable, Conway, Pa. (100). Reconstruction of Bridge 109.64, Massillon, Ohio (100). Reconstruction of Bridge 175.42, Mansfield, Ohio (30). Installation of 110-ft. turntable to replace 100-ft. turntable, Canton, Ohio (15). Reconstruction of Bridge 157.30, Loudonville,

Ohio (100). Extension of Bridges 56.28 and 55.64, Broadacre, Ohio (100). Construction of new freight house, Wheeling, W. Va. (100). Widen gage to standard, Waynesburg & Washington R. R., Washington, Pa., to Waynesburg (100). Extension of engine house, Olean, N. Y. (100). Construction of 2,970 ft. of toe wall for bank protection, Keating, Pa. (100). Construction of new machine shop and extension of enginehouse at Kinsman St, Cleveland, Ohio (100). Extension of enginehouse facilities, Mingo Jct., Ohio (100). Installation of 110-ft. turntable to replace 100-ft. turntable, Mingo Jct., Ohio (100). New coaling station at Kinsman St. enginehouse, Cleveland, Ohio (100). New water-type ash pits, Kinsman St. enginehouse, Cleveland, Ohio (100). Reconstruction of Ore Dock 11, Cleveland, Ohio (100). Extension of westbound receiving yard, construction of car repair and interchange facilities and completion of third and fourth main tracks on C. & N. division, Columbus, Ohio (100). Construction of receiving and storage tracks, hump yard office building and additional yard floodlighting, Sandusky, Ohio (100). Installation of C. T. C. machine in tower at London, Ohio, to control switches serving eastward and westward sidings together with incidental track changes respacing signals and fireproofing tower, Alton, Ohio (100). Reverse signaling of main tracks including incidental track changes, Whiting, Ind., to Clarke Jct. (100). Replace present coaling and water facilities at Carrothers, Ohio, with new plants at Harvey, Ohio, and extend second track 6,000 ft. at Harvey; replace water station at Monnette, Ohio, with new water station at Richland, Ohio, and install coaling station at Tiffin, Ohio (80). Construction of five auxiliary tracks with switches at east end of yard and main track crossover, controlled remotely; turnaround track from A. & S. interchange to enginehouse, Rose Lake, Ill. (70).

(Approximate cost of foregoing projects, $17,160,426.)

(Long Island) *Important Work Undertaken:* Construction of locomotive coaling and sanding facilities, inspection pit for electric locomotives, including rearrangement of tracks, Morris Park shops, Richmond Hill, N. Y. (100).

Pere Marquette

Grade Crossing Eliminations: Subway: Industrial Expressway, Dearborn, Mich., $730,000 (100).

Important Work Undertaken: Rebuilding bridge over Saginaw river, Saginaw, Mich., $900,000 (80).

Reading

Second Track: East Mahanoy Junction, Penna., to Haucks, 0.82 miles, $62,652 (100).

Richmond, Fredericksburg & Potomac

Important Work Undertaken: Extension of 12 stalls in enginehouse at Acca locomotive terminal, Richmond, Va., $120,000 (15). Revision of alinement and construction of double-track deck plate girder bridge across Aquia Creek, Aquia, Va., $1,450,000 (2).

St. Louis-San Francisco

First Track: Mead, Okla., to Lakeside, 4.06 miles. Ravia, Okla., to Randolph, 3.09 miles.

Grade Crossing Elimination: Overcrossing: U. S. Route 60, Wyandotte, Okla., $150,000 (60—work suspended indefinitely because of inability to obtain structural material).

Important Work Undertaken: Revision of alinement and reduction of grades, 7.11 miles, Jerome, Mo., to Dixon, $1,382,000 (100). Installation of centralized traffic control including extensions of three passing sidings to hold 120 cars, St. John, Mo., to Sleeper, 28 miles $190,000 (100). Installation of centralized traffic control including extensions of five passing sidings to hold 120 cars, Nichols, Mo., to Monett, 40 miles, $350,000 (100).

St. Louis Southwestern

Important Work Undertaken: Centralized traffic control including side track changes, Pine Bluff, Ark., to Lewisville, 121.8 miles, $980,000 (75).

Seaboard Air Line

Second Track: Jeffreys, N. C., to Crabtree, 4.85 miles.

Important Work Undertaken: Industrial spur and sidings, Boyette, Fla., $229,000 (68). Relocation of car shops and tracks, including an overhead highway bridge, Richmond, Va., $431,000 (100). Additional running track and yard facilities, Hamlet, N. C., $556,000 (100). Changes to passenger station facilities and tracks, installation of passenger subway, paving of roadways, Hamlet, N. C., $121,000 (86). Revision of alinement, vicinity of Nottoway river, Rawlings, Va., $535,000 (100). Running track, Raleigh, N. C., to Millbrook, $465,000 (100). Revision of alinement, including construction of culvert, Berkeley, Ga., $104,000 (100). Revision of alinement and grade and reconstruction of bridge, Omaha, Ga., $104,000 (100). Revision of alinement, Lilburn, Ga., to Gloster, $535,000 (100). Revision of alinement, Chester, S. C., $190,000 (100). Extension of yard and additions to transfer facilities, Hamlet, N. C., $290,000 (64). Second main line and yard tracks, Jacksonville, Fla., $290,000 (51). Replacement of spans on Roanoke River bridge, Weldon, N. C., $210,000 (26). Running track including revision of grade, Millbrook, N. C., to Neuse, $132,732 (88). Additions and changes to track facilities, station and signals, Starke, Fla., to Waldo, $157,848 (100). Construction of new passing siding and installation of automatic signals, Marston, N. C., to Aberdeen, $117,000 (65). C. T. C. including incidental track changes, Alberta, Va., to Norlina, N. C., $511,000 (100). C. T. C. including incidental track changes, Youngsville, N. C., to Raleigh, $206,000 (100).

Southern

First Track: Bryson, N. C., to Wesser, 15.3 miles.

Important Work Undertaken: Diesel locomotive repair shop, Alexandria, Va., $300,000 (80). Construction of reinforced concrete trestle to replace timber tunnel over Haw river, Reidsville, N. C., $137,000 (10). Renewal of steel bridge over Rapidan river, Rapidan, Va., $162,000 (10). Construction of concrete arch and filling of timber trestle, Vaughns Creek, Tryon, N. C., $140,500 (100). Construction of concrete arch and filling timber trestle, Greavers Hollow, Combs, Tenn., $199,000 (10). Construction of concrete culvert and farm road underpass, and filling timber trestle, Sunbright, Va., $113,000 (90).

Southern Pacific

Important Work Undertaken: Replacement of two spans and strengthening of three spans of bridge over Tuolumne river, Modesto, Calif., $102,000 (20). Replacement of two truss spans with plate girder spans on new foundation, Stanislaus river, Lathrop, Cal., $100,000 (35). Installation of C. T. C. including incidental track changes and application of power service, Lemay, Utah, to Bridge 52.8, $1,048,700 (20). Renewal of wood pipe with steel pipe including 4 miles of 21-in. pipe, 2.22 miles of 16-in. pipe and 4 miles of 6-in. pipe, Bonita Pipe Line, New Mexico, $130,000 (90).

(Texas & New Orleans) New continuous cantilever bridge over Pecos river, High Bridge, Texas, $1,403,151 (100). Extension to enginehouse, Houston, Tex., $126,665 (25).

Spokane, Portland & Seattle

Important Work Undertaken: Additional yard tracks. Wishram, Wash., $230,000 (100).

Texas & Pacific

Grade Crossing Elimination: Overcrossing: Sweetwater, Texas, $65,000 (75).

Important Work Undertaken: Construction of enginehouse, machine shop, and toilet and locker building, El Paso, Texas, $100,000 (15). 12 in. cast iron pipe line, 4 miles, construction of settling basin and installation of treating facilities and electrically operated pumps, Marshall, Texas, $100,000 (100).

Union Pacific

Grade-Crossing Eliminations: Three Union Pacific tracks and four A. T. & S. F. tracks, Aliso St., Los Angeles, Cal., $5,245,000 (100).

Important Work Undertaken: Reconstruction of power plant including installation of four 150 hp. boilers, La Grande, Ore., $100,000 (100). Extending seven enginehouse stalls 54 ft. and relocation of yard trackage serving enginehouse, Laramie, Wyo., $123,529 (100). Installation of modified direct steaming system in enginehouse, Laramie, Wyo., $130,388 (100). Revision of alinement involving 10,000 ft. of main line double track and raised roadbed 5½ ft. above existing track between Grantville, Kan., and Topeka, $382,500 (100). Reconstruct boiler room portion of power house and installed three 500 hp. boilers, construct new stack, Salt Lake City, Utah, $136,000 (100). Reconstruction of 13.51 miles of line to replace 9.37 miles of existing line and raise grade of 1.13 miles of existing line around Cascade Reservoir, Boise Project, Cascade, Idaho, to Donnelly, $455,027 (25). Relocate 0.35 miles of main track to eliminate tunnel No. 4, Meacham, Ore., $127,059 (100). New engine terminal complete with enginehouse, steam boiler plant and appurtenances, San Bernardino, Cal., $170,510 (100). Installation of 126 miles of centralized traffic control including the extension of six passing sidings to hold maximum length of trains, Las Vegas, Nev., to Caliente, $1,300,012 (70). Replacement of existing turntable with 100 ft. pony truss turntable converted to three-point-bearing type, North Platte, Nebr., $111,364 (100). Replace seven pile piers and two pile approach spans of bridge across Platte river, Beatrice branch, Valley, Nebr., with five concrete piers and two concrete abutments, $105,765 (100). Replace deck girder spans on concrete abutments and piers under two tracks with a 50-ft. concrete arch 68 ft. long, Bridge 604.54, Rock River, Wyo., $128,200 (100). Replace four 35-ton pocket conveyor type coaling stations with modern 300-ton coaling stations including relocation of water cranes, sand towers and trackage, Rock Springs, Wyo., $102,077 (100). Construction of trackage and road for team and yard tracks in connection with Food Terminal on Public Levee, Kansas City, Kans., $605,900 (100).

Union

Important Work Undertaken: Enlarging Munhall yard and constructing a track scale, Munhall, Pa., $400,000 (40). Construction of double track high level viaduct and single track low level viaduct together with incidental track changes, East Pittsburgh, Pa., and Bessemer, $2,450,000 (1).

Virginian

Important Work Undertaken: Additions and revisions to terminal yard, Sewalls Point, Va., $186,000 (100). Additions and extensions to shop and storehouse facilities, Princeton, W. Va., $425,000 (25). Extensions and improvements to enginehouse, Elmore, W. Va., $185,000 (100).

Western Maryland

Important Work Undertaken: Four additional tracks, extension of six tracks in classification yard, and installation of No. 12 crossover, Hagerstown, Md., $105,000 (100). Concrete fender system at coal pier, Port Covington, Baltimore, Md., $158,000 (65). Pontoon transfer bridge No. 3, Port Covington, Baltimore, Md., $225,000 (100).

Western Pacific

Important Work Undertaken: Additional ballast, Bryant, Nev., to Sulphur, 37.1 miles, $286,000 (100). Additional yard tracks, San Francisco, Cal., $128,000 (100). Additional yard tracks, Portola, Cal., $154,000 (100). New four-track train yard, Elko, Nev., $135,000 (100). Centralized traffic control, Oroville, Cal., to Portola, 116 miles, including rearrangement and extension of sidings, $1,300,000 (70).

Wheeling & Lake Erie

Important Work Undertaken: 796 ft. cellular-type steel-sheet bulkhead, Huron, Ohio, $132,121 (100).

Canada

Canadian National

New Road Under Construction: Eastern Junction to Bout de l'Ile, Montreal, 15 miles.

Grade Crossing Elimination: Overcrossings: Dundas Sub-division, Ont., (100).

Reconstruction of existing grade separation structures: Reconstruction of overcrossing together with grade clearance, Mile 35.8, Dundas subdivision, Ont. (100). Replace timber abutments with concrete, overhead bridge, Bell St., Ottawa, Ont. (100).

Important Work Undertaken: Construction of storage yard, Southwark, Que. (100). Construction of double track line, Butler Street connection, Montreal, Que. (100). Additional terminal facilities, Lake Edward, Que. (100). New line, Eastern Junction to Bout de l'Ile, 15 miles (to be completed in 1945).

Canadian Pacific

New Road Construction: Extension of line Osoyoos Sub-division, from Osoyoos, B. C., 9.5 miles.

Important Work Undertaken: Reconstruction and extending of five stalls, enginehouse, Chapleau, Ont., $105,000 (100). New Diesel repair shop, Hochelaga, Que., $162,000 (100). Additional rock ballast, Megantic subdivision, 46 miles, $400,000 (100). Dining car building, Montreal, Que., $260,000 (70). Additional rock ballast, Lachute sub-division, 20 miles, $180,000 (100).

Toronto, Hamilton & Buffalo

Important Work Undertaken: Changes to Dock No. 2, Port Maitland, Ont., $10,000 (100).

Mexico

Southern Pacific Railroad of Mexico

Grade-Crossing Elimination: Overcrossings: International Highway, kilometer 13, $13,000 (100). International Highway, kilometer 1,161, $15,000 (100). International Highway, kilometer, 1,166, $15,000 (100). International Highway, kilometer, 1,595, $14,000 (100). International Highway, kilometer 1,619, $14,000 (100).

signal construction LESS *in 1944*

More C. T. C. and highway crossing protection but less interlocking, automatic block and spring switches

By JOHN H. DUNN
Signaling Editor

DURING 1944 the railroads of the United States and Canada installed less signaling than in the previous year, but the totals for 1944 were larger than for any other previous year since 1931. Counting all systems of signaling, a total of 7,746 units were installed last year, as compared with 8,752 units in 1943, the figures for the previous 10 years ranging from a low of 2,507 units in 1934 to a high of 7,159 in 1940. In 1944 the construction of centralized traffic control was greater than in any previous year, but reductions were shown in construction of automatic block signaling, interlocking and spring switches. Although more automatically-controlled highway crossing protection was installed in 1944 than in the previous year, the totals for this system of signaling are still very low because of war-time restrictions.

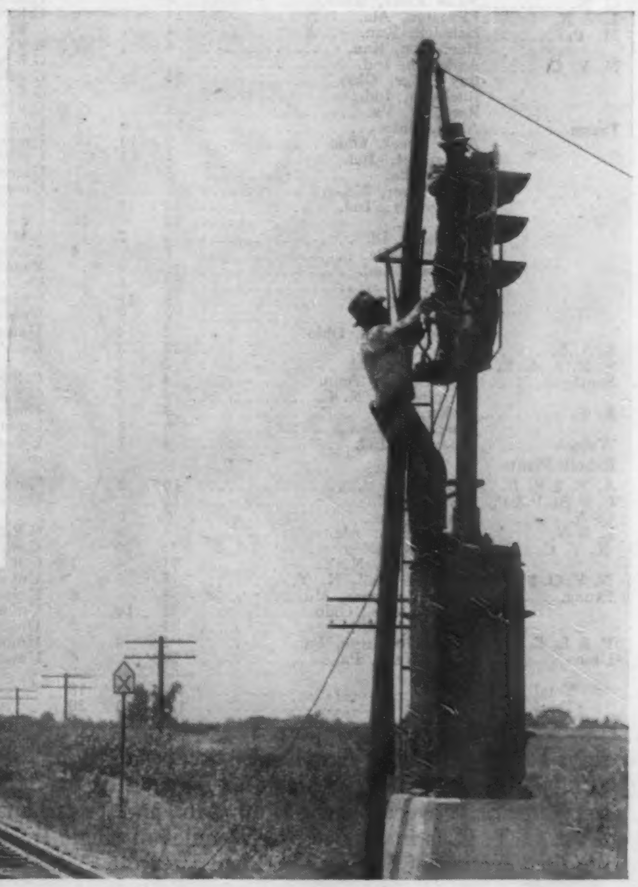
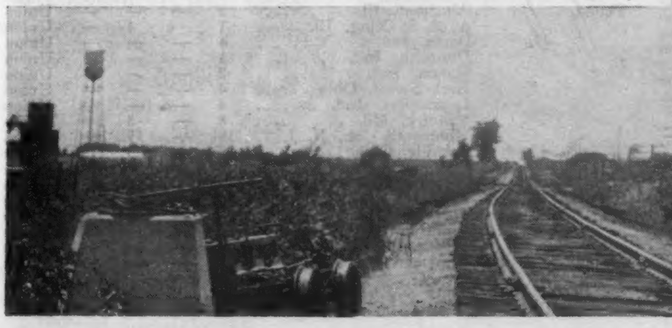
C. T. C. Increasingly Popular

C. T. C. placed in service during 1944 included 1,326 track miles, 596 power switches and 2,141 signals as compared with 1,177 track miles, 463 power switches and 1,775 signals for 1943, the previous peak year. Reviewing the three war years, C. T. C. was installed on 889 miles of track in 1942, on 1,154 miles in 1943 and 1,326 miles in 1944. The total of 3,369 miles installed in the three war years compares with a total of 2,703 miles, which was installed from the time C. T. C. was developed in 1927 until January 1, 1942. The reason for this rapid extension of C. T. C. is that this system provides a means for increasing the capacity of existing tracks, cars and locomotives, in a minimum construction period and at a relatively small cost as compared with second track or more locomotives.

Of the C. T. C. placed in service in 1944 the longest project was on 112 miles of single track and 2.6 miles of double track on the Nashville, Chattanooga & St. Louis between Nashville, Tenn., and Stevenson, Ala. The Santa Fe made two long installations; 101 miles between Los Angeles, Cal., and San Diego, and 105 miles between Vaughn, N. M., and Belen.

Some of the shorter projects installed in 1944 were made to complete C. T. C. operations over extended territories. For example, the 50 miles of C. T. C. installed in 1944 on the Rio Grande completed an overall territory of 284 miles between Dotsero, Colo., and Helper, Utah. The 45 miles installed by the Canadian National between Truro, N. S., and Windsor Jct. completed the 185-mile division between Moncton, N. B., and Windsor Jct. The 50 miles of C. T. C. installed by the Milwaukee between Laredo, Mo., and Polo, brings the entire engine district between Laredo and Kansas City under train operation by signal indication. On the 483 miles of single track on the Burlington between Lincoln, Neb., and Denver, Colo., C. T. C. was installed on 112 miles between Denver, Colo., and Akron in 1937, and in 1944 the 98 miles were equipped between Lincoln and Hastings, while a project is planned to complete the remaining 274 miles. Similarly during 1944 the Union Pacific and the Southern Pacific made sizable installations of C. T. C. which fit in as parts of overall divisional operations.

On some other railroads where sections of single track and double track are interspersed C. T. C. has been installed on the single track while on the double track

A Gin Pole Aids in the Erection of Signals

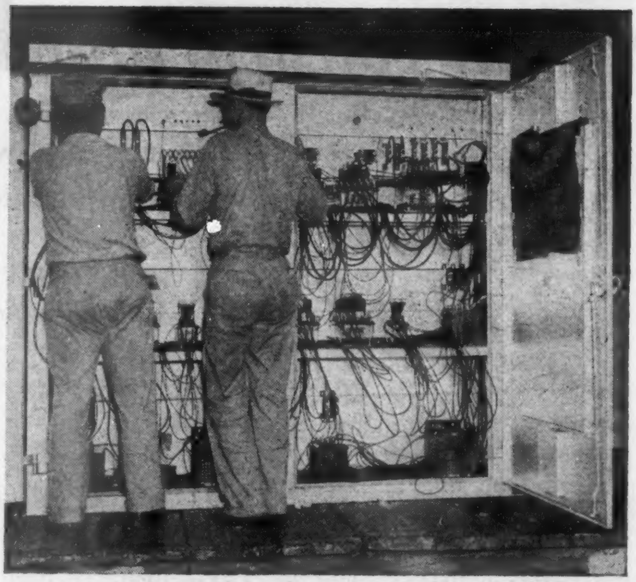
Comparison of Annual Signaling Construction

	1944	1943	1942	1941
Automatic Block Signals	...	...	1,421	1,407
Signals on new projects	974	1,139	...	...
Signals installed as replacements	565	1,551	...	...
Interlockings				
Signals and switches at new plants	851	1,498	785	518
Signals and switches added at rebuilt plants	687	760	554	693
Signals and switches at automatic plants	62	55	78	80
Spring Switches				
Spring buffer mechanisms	382	448	284	275
Mechanical facing-point locks	115	88	126	159
Signals at spring switches	553	498	384	354
Centralized Traffic Control				
Power switch machines	596	463	263	190
Semi-automatic signals	2,141	1,775	1,030	675
Classification Yards				
Car retarders	25	...	51	...
Power switch machines	52	...	108	...
Highway Crossing Protection				
Protective units	643	477	1,297	2,615
Totals	7,646	8,752	6,381	6,966

All-Relay Interlockings Constructed in 1944

Railroad	Location	Number of Signal Operative Units	Number of switches or derails operated by: Electric Machines	Electro-Pneumatic	Manufacturer
New Plants					
A. T. & S. F.	Vaughn, N. M.	12	5	..	Union
B. & M.	Concord, N. H.	24	21	..	G.R.S.
	Haverhill, Mass.	10	..	..	G.R.S.
	Manchester, N. H.	53	34	..	Union
	No. Billerica, Mass.	9	..	..	G.R.S.
B. & O.	Sir Johns Run, W. Va.	6	3	..	G.R.S.
C.M.St.P.&P.	Birmingham, Mo.	14	3	..	Union
	Kittredge, Ill.	9	3	..	Union
	River Jct., Minn.	4	1	..	G.R.S.
	St. Paul, Minn.	7	3	..	Union
C. N.	Scioto Jct., Ohio	12	5	..	G.R.S
	Ste. Annes, Que.	4	1	..	....
	Prescott, Ont.	4	1	..	....
C. & O.	Midkiff, W. Va.	8	2	..	Union
	Thurmond, W. Va.	4	1	..	Union
C. P.	Franz, Ont.	9	1	..	G.R.S.
	Romford, Ont.	8	4	..	G.R.S.
C. R. I. & P.	El Reno, Okla.	9	1	..	Union
D. & R. G. W.	Helper, Utah	17	4	..	G.R.S.
Erie	Polk, Ohio	10	2	..	Union
	Transfer, Pa.	9	3	..	Union
G. N.	Swan River, Minn.	8	3	..	G.R.S.
L. & N.	Flomaton, Ala.	14	2	..	G.R.S.
M. P.	Helmick, Kan.	4	1	..	G.R.S.
	Herington, Kan.	4	1	..	G.R.S.
N. Y. C.	Anderson, Ind.	..	..	..	G.R.S.
	Bay Ridge, Ohio	24	16	..	G.R.S.
	Buckskin, Ind.	..	..	..	G.R.S.
	Reed, W. Va.	6	..	..	G.R.S.
Penna.	Alton, Ohio	12	6	..	Union
	Alum Creek, Ohio	9	13	..	Union
	Bridgeport, Ind.	3	1	..	Union
	Bulger, Pa.	3	..	1	Union
	Bush River, Md.	6	..	3	Union
	Dublin Jct., Ind.	12	4	..	Union
	Etna, Pa.	12	..	10	Union
	Highland, Ill.	6	2	..	Union
	Holtwood, Pa.	7	..	4	Union
	Jacksons, Ind.	12	4	..	Union
	Marty, Ill.	12	4	..	Union
	Riley, Ind.	5	11	..	Union
	St. Jacob, Ill.	7	3	..	Union
	Sunbury Road, Ohio	5	4	..	Union
S. A. L.	Raleigh, N. C.	12	3	..	Union
S. D. & A. E.	San Diego, Cal.	2	..	..	....
Southern	John Sevier, Tenn.	4	2	..	G.R.S.
	Murphy Jct., N. C.	4	2	..	G.R.S.
S. P.	Ogden, Utah	3	1	..	Union
	Pomona, Cal.	6	1	..	Union
Wabash	Lafayette, Ind.	4	1	..	Union
Rebuilt Plants					
A. T. & S. F.	Lebo, Kan.	10	2	..	Union
C.M.St.P.&P.	Savanna, Ill.	10	..	..	Union
C. N.	Allenby, Que.	6	1	..	....
L. & N.	Birmingham, Ala.	4	1	..	G.R.S.
N. Y. C.	Cleveland, Ohio	15	20	..	G.R.S.
	Mt. Vernon, N. Y.	21	14	..	G.R.S.
N. Y. O. & W.	Campbell Hall, N. Y.	7	3	..	Union
Penna.	Havre de Grace, Md.	8	..	6	Union
	Leonard Ave., Ohio	11	16	..	Union
	Oakington, Md.	11	..	8	Union
P. & L. E.	West Pittsburgh, Pa.	2	4	..	Union
Union	Tower Yard, Pa.	19	..	6	Union
Total New Plants		448	183	18	
Total Rebuilt Plants		124	61	20	

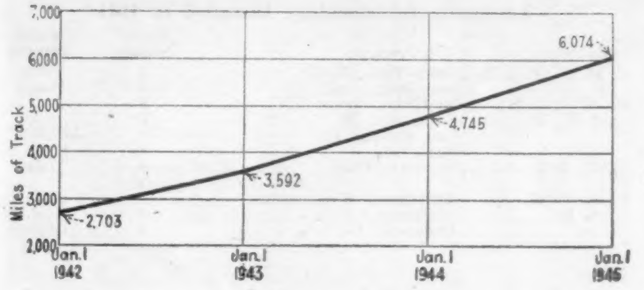
right-hand running by signal indication is in effect. For example, on the 323-mile Arkansas division of the Missouri Pacific between Poplar Bluff, Mo., and Texarkana, Ark., C. T. C. is in service on 197 miles of single track, the final section of 50 miles between Prescott, Ark., and



Signal Relay Cases Are Wired at Field Construction Headquarters

Interlockings with Mechanical Locking Constructed in 1944

Railroad	Location	Number of Signal Operative Units	Number of Switches or Derails Operated by: Electric Machine	Electro-Pneumatic	Mechanical Connection	Manufacturer
New Plants						
Erie	Campbell Hall, N. Y.	9	4	—	—	Union
	Ohio City, Ohio	10	—	—	—	Union
I. C.	Amboy, Ill.	4	—	—	1	Union
	Lake Cormorant, Mis.	4	1	—	2	Union
	Mt. Pulaski, Ill.	5	21	—	3	Union
	New Orleans, La.	11	3	—	6	Union
L. & H. R.	Franklin, N. J.	5	—	—	—	G.R.S.
M. & St. L.	Keithsburg, Ill.	2	—	—	—	Union
Penna.	Clarke Jct., Ind.	5	3	—	—	Union
	Dunreith, Ind.	6	2	—	—	Union
	East Portage, Pa.	4	—	2	—	Union
	Gallitzin, Pa.	8	—	12	—	Union
	Lakeville, Ohio	8	—	—	4	Union
	Logansport, Ind.	10	—	—	—	Union
	Massillon, Ohio	7	—	3	5	Union
	Newton, Ind.	2	—	—	—	Union
Reading	Lurgan, Pa.	10	2	—	—	G.R.S.
Union	Rankin, Pa.	7	—	3	—	Union
Wabash	Strawn, Ill.	6	—	—	2	......
Rebuilt Plants						
A. T. & S. F.	Dalies, N. M.	18	8	—	—	G.R.S.
	San Berardino, Cal.	45	38	—	—	G.R.S.
	Topeka, Kan.	5	—	—	1	Union
B. & M.	Claremont Jct., N. H.	2	2	—	—	......
	Northampton, Mass.	12	—	—	—	G.R.S.
B. & O.	Forest Park, Ill.	10	—	13	—	Union
	Layton, Pa.	6	—	—	6	......
C. & O.	Peru, Ind.	2	—	—	1	Union
	Russell, Ky.	20	—	9	—	Union
D. L. & W.	Groveland, N. Y.	1	—	—	—	Union
L. & N.	Birmingham, Ala.	12	—	—	6	G.R.S.
	Flomaton, Ala.	2	—	—	2	G.R.S.
	Vulcan, Ala.	8	—	—	8	G.R.S.
M. & St. L.	Keithsburg, Ill.	4	—	—	3	......
Penna.	Altamont, Ill.	2	—	—	—	Union
	A. & S. Xing, Ill.	1	—	4	—	Union
	Davis, Ind.	4	—	—	—	Union
	Dunreith, Ind.	1	—	—	1	Union
	Hanna, Ind.	2	—	—	—	Union
	High Street, Ohio	4	—	—	—	Union
	Logansport, Ind.	4	—	—	—	Union
	Minnick, Md.	8	—	3	—	Union
	Monmouth, Jct., N. J.	19	—	19	—	Union
	Orrville, Ohio	20	—	5	15	Union
	Pittsburgh, Pa.	13	—	19	—	Union
	Portage, Pa.	—	—	16	—	Union
	Princeton Jct., N. J.	29	—	17	—	Union
	Torrence, Pa.	—	—	14	—	Union
	Whiting, Ind.	2	4	—	2	Union
	Woods, Ind.	2	—	—	—	Union
Union	Bessemer, Pa.	8	—	—	—	Union
Total New Plants		123	36	20	23	
Total Rebuilt Plants		266	52	119	45	



Graph Showing the Increase in Miles of Track in the United States and Canada Which Were Equipped with C. T. C. During the Past Three Years

Texarkana being completed in 1944. It is evident that C. T. C. is gradually being extended so that train movements over complete engine districts can be authorized by the indications of signals thus superseding timetables and train orders. Further rapid strides in this change will be made after the war.

Interlocking Construction Decreased

In 1944 the number of operative signal units and interlocked switches installed at new interlockings, or as additions to plants, totaled 1,600 units, which was a decrease from 2,313 units in 1943. The 1944 interlocking construction was confined to comparatively small projects which were pushed to completion in order to improve train operations under wartime difficulties. The only sizable plant completed in 1944 was on the Boston & Maine at Manchester, N. H., this project including the combined control of previous plants which had been worn beyond reasonable repair.

The modern method of interlocking is by means of circuits, through relays which obviates the use of old style mechanical locking and results in much faster operation of the control machines, which in reality are panels with miniature levers or buttons to control the signals and switches.

Plants using this "all-relay" form of control are listed in a separate table, and a separation is made to show which plants were all new, in contrast with those which were reconstructed, the figures given being for new signals or switches were added in 1944.

A separate table lists the 1944 interlocking construc-

Territories of Automatic Block on Which Old Signals Were Replaced with Modern Signals

Railroad	Location	Miles of Road	No. of Signals	Manufacturer
B. & M.	Dover, N. H.—Rockingham	9.7d	13c	G.R.S.
	Newfields, N. H.—Newton Jct.	12.9d	16c	G.R.S.
	Newton Jct., N. H.—Lawrence, Mass.	13.8d	22c	G.R.S.
	Wakefield Jct., Mass.—Edgeworth	4.9d	13c	G.R.S.
	Wilmington, Mass.—Bleachery	8.2d	9c	G.R.S.
	Chelmsford, Mass. — Nashua, N. H.	7.6d	9c	G.R.S.
	Nashua, N. H.—Concord	32.8d	41c	G.R.S.
	Claremont Jct., N. H.	1.0s	1c	G.R.S.
	Bellows Falls, Vt.—Putney	14.6d	17c	G.R.S.
	Deerfield, Mass.—Brightwood	31.7d	38c	G.R.S.
	Claremont Jct., N. H.	1.6d	1c	G.R.S.
	Rottendam Jct., N. Y.	0.7s	1c	G.R.S.
	Eagle Bridge, N. Y. — Johnsonville	4.7d	7c	G.R.S.
	Johnsonville, N. Y. — Mechanicville	11.7d	19c	G.R.S.
	Station signals	...	5c	......
N. Y. C.	Poughkeepsie, N. Y.—Tivoli	22.0s 5.0d	80c	G.R.S.
	Hudson, N. Y.—Stockport	3.0d	3c	G.R.S.
	Schenectady, N. Y.—Hoffmans	3.0s 7.0d	20c	G.R.S.
	Garrison, N. Y.—Peekskill	...	3c	G.R.S.
B. & A.	Springfield, Mass.—Chester	27.5d	35c	G.R.S.
M. C.	Jackson, Mich.—Kalamazoo	68.0d	104c	G.R.S.
P. & L. E.	Pittsburgh, Pa.—McKeesport	1.8f 10.5d	15c	Union
Reading	W. Conshohocken, Pa. — Norristown	4.9d	8c	G.R.S.
	No. Abrams, Pa.—Perkiomen Jct.	4.5f	10c	G.R.S.
	Lewisburg, Pa.—Williamsport	32.2d	36c	G.R.S.
U. P.	Manhattan, Kan.—Junction City	20.0s	33c	Union
	Albina, Ore.—Portland	2.0s	6c	Union
		48.7s 312.3d 6.3f	565c	
Road Miles		367.3		
Track Miles		698.5		

Legend:
In "Miles of Road" column: s = single track, d = double track, f = four track.
In "No. of Signals" column: c = color-light.

The Installation of Cable Is an Important Part of Interlocking Construction

New Automatic Block Signaling Placed in Service During 1944

Railroad	Location	Miles of Road	No. of Signals	Manufacturer
A. T. & S. F.	Clovis, N. M.—Gallaher	4.0d	1s	Union
			6c	Union
	Gallaher, N. M.—Melrose	15.0d	17s	Union
			3c	Union
	Joffre, N. M.—Vaughn	10.0d	10s	Union
			1c	Union
	Colton, Cal.—Highgrove	3.5d	11c	Union
	Mormon, Cal.—Stockton	2.1d	9c	Union
	Old Town, Cal.—San Diego	3.3d	8c	Union
B. & O.	Daniels, Md.—Point of Rocks	47.4s	27s	Union
	Miller, W. Va.—Cumbo	11.6s	4s	Union
			4c	
	Miller, W. Va.—Hancock	8.7s	6s	Union
	Brook, Pa.—Confluence	6.7s	2s	......
			1c	
	Scioto Jct., Ohio—VA Jct.	2.6s	3c	G.R.S.
	RA Jct., Ohio—West Jct.	3.9s	3c	G.R.S.
C. of G.	Sylacauga, Ala.—Vandiver	26.0s	3s	Union
			33c	Union
C. N.	Newcastle, N. B.	1.5s	1s	G.R.S.
C. P.	Megantic, Que.—Boundary, Me.	15.9s	18c	G.R.S.
	Brockville, Ont.	1.3s	2c	G.R.S.
	Chalk River, Ont.	6.2s	4c	Union
	Mactier, Ont.	5.0s	4c	G.R.S.
	Sudbury, Ont.—Sprecher	2.8s	4c	G.R.S.
	Sudbury, Ont.—Creosote	2.6s	3c	G.R.S.
	Sudbury, Ont.—Mileage 1.0	1.0s	2c	G.R.S.
	Cartier, Ont.	4.5s	...	Union
	Swift Current, Sask. — Maple Creek	84.0s	118c	G.R.S.
	Medicine Hat, Alta.—Suffield	28.0s	36c	G.R.S.
C. R. I. & P.	Perlee, Iowa—Eldon	23.0s	26c	Union
C. S. S. & S. B.	East Chicago, Ind.—Hammond	1.0d	2c	
D. L. & W.	East Secaucus, N. J.—Kingsland	1.8d	7c	Union
	Chester Jct., N. J.—Hopatcong	3.9f	9c	Union
E. J. & E.	Van Loon, Ind.—Ivanhoe	2.0d	3s	G.R.S.
			1c	
Georgia	Augusta, Ga.—Harlem	22.8s	21s	Union
			16c	
G. N.	Swan River, Minn.	1.0s	6s	G.R.S.
		2.0d		
I. C.	Masonville, Iowa—Rath	35.6s	50c	Union
M-K-T	Sloan, Tex.—Warden	2.0s	6c	Union
	At five stations	......	2s	Union
			3c	
M. P.	Lamine, Mo.—Myrick	63.8s	81c	G.R.S.
		3.0d		
	Myrick, Mo.—Eton	23.2s	34c	G.R.S.
		1.9d		
	Wagoner, Okla. — Coffeyville, Kan.	79.0s	116c	G.R.S.
	Forest Hill, La.—Kinder	41.7s	54c	G.R.S.
	Kenefick, Tex.—Beaumont	46.7s	56c	G.R.S.
M. St. P. & S. S. M.	Leithton, Ill.—Mundelein	2.5s	4c	G.R.S.
	Waukesha, Wis.—Duplainville	3.0s	9c	G.R.S.
N. Y. C. & St. L.	Ft. Wayne, Ind.—West Wayne	1.0d	2c	Union
P. E.	Dominguez Jct., Cal.—San Pedro	.....	2c	Union
Penna.	Hicksville, N. Y.—Bethpage	3.7d	4p	Union
	Davis, Ind.—Kraft	......	2p	Union
	Mansfield, Ohio—M. P. 187	11.2s	5p	Union
	Reverse running signal added	.....	5p	Union
St. L.-S. F.	Henryetta, Okla.—Weleetka	12.6s	14c	Union
S. A. L.	Monroe, N. C.—Waxhaw	12.1s	23c	Union
	Columbia, S. C.—Elmwood	3.0s	5c	Union
T. & N. O.	Shreveport, La.—Rosen	5.5s	13s	Union
T. & P.	Ft. Worth, Tex.	2.2s	5c	G.R.S.
		1.1d		
T. R. R. A. of St. L.	May St., St. Louis, Mo.—Page Ave.	6.3d	27c	Union
Union	Munhall, Pa.—"J" Tower	1.8d	10c	Union
U. P.	Pendleton, Ore	3.0s	6c	Union
Wabash	Kinderhook, Ill.—East Hannibal	11.2s	12c	Union
W. P.	Delleker, Cal.—Portola	1.4s	6c	Union
		666.2s	116s	
		63.5d	859c	
		3.9f	16p	
Road Miles		733.6	991	
Track Miles		808.8		

Legend:
In "Miles of Road" column: s = single track, d = double track, f = four track.
In "No. of Signals column: s = semaphore, c = color-light, p = position light.

tion of plants using the older forms of mechanical locking between levers, and here again a separation is made between new plants and those which were reconstructed.

Less Automatic Block

The all-relay interlocking table lists 50 new plants as compared with only 19 new plants in the table listing plants with mechanical locking. This difference is an indication of the increasing preference of all-relay controls for new interlocking.

Automatic Interlockings Installed in 1944

Railroad	Location	No. of Signals	Manufacturer
C. M. St. P. & P.	Sioux Falls, S. D.	4	Union
	Beehunter, Ind.	4	Union
C. N.	St. Cloud, Ont.	8	......
C. & N. W.	Normandy, Ill.	8	......
	Van Petten, Ill.	6	......
	Buda, Ill.	8	......
D. T. & I.	Napoleon, Ohio	6	Union
		2*	
C. B. & W.	Marshland, Wis.	4	G.R.S.
L. S. & I.	Marquette, Mich.	8	G.R.S.
Union	Duquesne, Pa.	4	Union
		60	
		2*	
Total		62	

Legend:
* = derails.

The new installations of automatic block signaling which were placed in service during 1944 totaled 808 miles of track, including 991 signals, as compared with 875 miles and 1,139 signals in 1943. As applying to single-track lines not previously signaled the modern trend is to install centralized traffic control rather than straight automatic block. For this reason the sizable installations of automatic block were confined to a few roads, such as 79 miles between Wagoner, Okla., and Coffeyville, Kan., on the Missouri Pacific; 84 miles between Swift Current, Sask., and Maple on the Canadian Pacific; and 35 miles between Masonville, Iowa, and Rath on the Illinois Central.

Spring Switches Installed During 1944

Railroad	Total No. of Spring Switches Installed	Classification as to Application: End of Passing Track	End of Double Track	Junction	Yard Track	Total No. Equipped With Facing Point Lock	Signal Protection: Low Signals	High Signals
A. B. & C.	2	..	2	..	..	..	..	..
A. C. L.	1	1	..	..	..	1	..	..
Alton	2	2	..	..	..	..	..	2
A. & S.	4	..	4	..	..	..	..	..
A. T. & S. F.	62	51	4	1	4	..	98	37
B. & M.	3	..	..	..	3	..	..	..
B. & O.	4	4	..	..	..	..	3	7
C. B. & Q.	6	6	..	..	..	6	6	..
C. & E. I.	2	2	..	..	..	2	2	2
C. of Ga.	6	5	..	..	1	..	6	..
C. I. & L.	6	6	..	..	..	..	10	..
C. & I. M.	9	9	..	..	..	..	..	7
C. M. St. P. & P.	23	22	..	..	1	23	15	12
C. N.	13	2	1	..	10	..	3	4
C. & N. W.	3	1	2	..	..	3	6	1
C. & O.	5	4	..	..	1	3	4	3
C. R. I. & P.	2	2	..	..	..	2	..	3
C. S. S. & S. B.	2	2	..	..	..	..	2	..
D. & H.	1	1	..	..	..	1	3	..
D. & R. G. W.	5	3	..	..	2	2	6	3
E. J. & E.	2	2	..	..	..	..	2	..
Erie	5	5	..	..	..	5	1	6
Georgia	2	2	..	..	..	2	..	..
G. N.	10	6	1	3	..	10	16	4
I. C.	22	21	..	..	1	..	25	2
L. & N.	50	48	..	2	..	..	92	12
L. & N. E.	1	..	..	..	1	..	..	1
L. V.	3	1	1	1	..	3	1	4
M-K-T	2	1	1	..	..	..	..	1
M. P.	9	6	2	..	1	9	19	8
M. St. P. & S. S. M.	8	6	..	..	2	6	12	8
N. C. & St. L.	2	..	..	..	2	..	3	3
N. P.	2	1	..	..	1	6	4	5
N. Y. C.	3	1	2	..	..	1	3	1
N. Y. C. & St. L.	1	1	..	..	..	..	..	1
Penna.	5	2	1	..	2	3	1	..
P. M.	3	3	..	..	..	3	2	..
St. L.-S. F.	10	9	..	1	..	8	19	4
St. L. S. W.	5	3	..	2	..	5	5	..
S. A. L.	5	3	..	1	1	5	5	2
Southern	22	19	..	..	..	..	..	..
A. G. S.	4	4	..	..	..	..	..	..
G. S. & F.	16	16	..	..	..	..	..	..
N. O. & N. E.	6	6	..	..	..	..	..	..
S. P.	6	6	..	..	..	6	12	3
T. & N. O.	9	5	..	2	2	..	..	1
T. & P.	6	6	..	..	..	..	12	6
U. P.	2	1	..	..	1	..	..	2
Totals	382	307	21	13	36	115	398	155

Centralized Traffic Control Completed in 1944

Railroad	Location	Miles of Road	Direct Wire or Coded Control	No. of Levers	No. of Power Switches	No. of Signals	Manufacturer
A. T. & S. F.	Vaughn, N. M.-Belen	105.0s	C	86	44	124	Union
	Bandini, Cal.-Old Town	101.3s	C	142	62	156	Union
C. B. & Q.	Lincoln, Neb.-Hastings	98.4s	C	59	26	112	G.R.S.
C. of G.	Terra Cotta, Ga.	2.0d	DW	7	5	12	Union
C. M. St. P. & P.	Laredo, Mo.-Polo	51.0s	C	24	12	48	Union
	Manilla, Iowa-Neola	..	C	..	5	6	Union
C. N.	Truro, N. S.-Windsor Jct.	45.5s 1.9d	C	50	18	60	G.R.S.
C. & O.	Poplar Springs, Va.-East End Fulton	2.2s 2.6d	C	18	5	17	Union
	Newport News, Va.-Oriana	11.4d	DW-C	17	6	8	Union
C. P.	Saint John, N. B.-Fairville	2.0s	DW	1	..	3	G.R.S.
	Leaside, Ont.-Don	3.1s	DW	4	..	4	Union
C. R. I. & P.	Allerton, Iowa-Trenton, Mo.	39.3s 13.0d	C	42	15	61	Union
D. & R. G. W.	Grand Jct., Colo.-Agate, Utah	50.0s	C	46	22	79	G.R.S.
Erie	River Jct., N. Y.-Cuba Jct.	32.7s	C	16	4	24	Union
I. C.	Eureka, Ky.-Gilbertsville	4.8s	C	10	3	13	Union
K. C. S.	DeQuincy, La.-Beaumont, Tex.	46.0s	C	35	18	51	G.R.S.
L. & N.	Bolling, Ala.-Catoma	48.0s	C	41	18	75	G.R.S.
M. P.	Prescott, Ark.-Texarkana	36.2s 9.8d	C	40	22	69	G.R.S.
N. C. & St. L.	Nashville, Tenn.-Stevenson, Ala.	112.5s 2.6d	C	135	58	214	Union
N. & W.	Bluestone, W. Va.-Switchback	0.7s 5.4d	C	17	17	27	Union
	Bluestone, W. Va.-Clift Yard	3.4s	..	3	..	1	Union
N. Y. C. & St. L.	Madison, Ohio-Euclid	28.2s	C	45	11	54	Union
P. M.	Fox, Mich.	..	C	..	1	6	G.R.S.
St. L.-S. F.	Swedeborg, Mo.-Sleeper	18.3s 3.7d	C	16	7	31	Union
	Nichols, Mo.-Monett	35.5s 3.1d	C	48	13	78	Union
S. A. L.	Alberta, Va.-Manson, N.C.	42.0s	C	51	29	100	Union
	Starke, Fla.-Waldo	13.6s	C	11	5	6	Union
	Edgeton, N. C.-Hillsboro St.	2.0d	C	12	8	24	Union
S. P.	Beaumont, Cal.-Indio	42.8s	C	111	36	137	Union
	Vista, Nev.-Massie	43.5s	C	51	29	102	Union
T. & P.	East Dallas, Tex.-Orphans Home	4.0s	DW	4	1	9	G.R.S.
	Big Sandy, Tex.-West End	1.0s	DW	2	1	5	G.R.S.
	Terrell, Tex.-East End	0.8s	DW	2	.	4	G.R.S.
	Cisco, Tex.-East End	1.7s	DW	2	1	5	G.R.S.
U. P.	Pendleton, Ore.-LaGrande	69.1s 3.9d	C	123	52	264	Union
Wabash	Decatur, Ill.-Starne	34.7s	C	18	..	27	Union
W. P.	Poe, Cal.-Delleker	86.0s	C	85	42	125	Union
		1,203.3s 61.4d		1,374	596	2,141	
	Road Miles	1,264.7					
	Track Miles	1,326.1					

Legend:
In "Miles of Road" column: s = single track, d = double track.
In "Direct Wire or Coded Control" column: C = coded control, DW = direct wire control, DW-C = direct wire and code.

Highway-Railroad Grade Crossing Protection Installed During 1944

Railroad	No. of Crossings	Total No. of Protective Units	No. of Wig-Wag Signals	No. of Flashing Light Signals	No. of Rotating Disk Stop Sign Signals	No. of Electrically Operated Gates
A. C. L.	6	15	..	11	..	4
Alton	3	6	..	4	..	2
A. T. & S. F.	16	32	9	19	..	4
A. & W. P.	1	2	..	2	..	..
B. & M.	5	14	..	11	..	3
B. & O.	5	14	..	14	..	
C. B. & Q.	1	2	..	2	..	..
C. G. W.	1	2	..	2	..	
C. I. & L.	2	2	..	1	..	1
C. M. St. P. & P.	6	18	1	7	6	4
C. N.	12	24	..	24	..	
C. & N. W.	12	50	2	22	..	26
C. & O.	1	2	..	2	..	
C. P.	15	45	..	29	13†	3
C. R. I. & P.	11	22	..	2	2	18
C. R. R. of N. J.	2	4	..	4	..	..
C. S. S. & S. B.	2	2	..	..	..	2
C. V.	2	5	..	5	..	.
D. & H.	15	36	..	36	..	
D. L. & W.	6	20	..	14	..	6
D. M. & I. R.	3	6	..	..	6	..
D. & R. G. W.	1	4	..	4	..	..
Erie	3	8	..	7	..	1
G. C. L.	1	2	..	2	..	..
G. M. & O.	1	2	..	2	..	..
G. N.	3	6	..	..	6	..
G. S. & F.	1	2	..	2	..	..
G. T. W.	7	14	..	14	..	..
I. C.	2	4	..	4	..	..
I. G. N.	1	2	..	2	..	..
L. & N.	7	18	..	14	..	4
L. & N. E.	3	6	..	6	..	..
L. V.	2	4	..	4	..	..
M-K-T	1	2	..	2	..	..
M. P.	5	14	..	10	..	4
M. & St. L.	1	2	..	..	2	..
M. St. P. & S. S. M.	7	23	3	10	10	
N. P.	2	4	..	..	4	
N. S.	2	2	..	2	..	..
N. & W.	2	4	3	1	..	
N. Y. C.	14	33	..	27	..	6
N. Y. C. & St. L.	2	8	..	4	..	4
N. Y., N. H. & H.	11	24	..	24	..	..
Penna.	6	16	..	12	..	4
P. E.	8	20	10	8	..	2
P. M.	1	2	..	2	..	
Reading	3	5	..	5	..	
St. L.-S. F.	3	5	..	3	..	2
St. L. S. W.	11	22	..	22	..	..
S. A. L.	4	8	..	8	..	..
S. D. & A. E.	3	6	..	2	4	..
Southern	8	16	..	10	6	
S. P.	6	12	4	6	..	2
T. & N. O.	2	4	2	2	..	..
T. & P.	1	4	..	2	2	..
U. P.	1	2	..	2	..	..
Virginian	1	2	..	2	..	..
W. & L. E.	1	2	..	2	..	..
W. M.	2	4	..	4	..	..
Y. & M. V.	1	2	..	2	..	..
	268	643	34	446	48 13† 61	102

Legend:
† = stop-and-go crossing signals.

On other roads sizable installations of automatic block signaling are included in C. T. C. projects which were installed on territory where no signaling was previously in service, as, for example, on 51 miles on the Milwaukee between Laredo, Mo., and Polo, and on 116 miles on the Western Pacific between Portola, Cal., and Oroville, 86 miles of this project being finished in 1944.

Reconstruction of Signaling a Big Factor

On a total of 686 track miles, the railroads during 1944 reconstructed existing automatic block, but this cannot be classed as new signaling mileage, and, therefore, these projects are listed in a separate table. The volume of materials involved in these programs varies widely. In some instances the old semaphores were merely replaced by colorlight signals. In other projects, entirely new signals, masts and foundations were installed, together with modern equipment for coded track circuit controls, thus eliminating the old track relays, line relays, and line wires. The replacement is thus equivalent to entirely new construction.

These reconstruction programs for 1944 included 47 miles of single track, 310 miles of double track and 4 miles of four-track line, using 565 new signals. Because of the war these rehabilitation programs have been limited to those territories which were in need of repair in order to increase safety, whereas, after peace comes numerous other such projects will be scheduled as fast as materials and men are available.

Highway Crossing Protection

Because the volume of highway traffic has been reduced by gasoline rationing the War Production Board limited new construction of highway crossing protection

Switch Machines Are Given Final Testing Before Being Placed in Service

to new crossings in the vicinities of military camps or war industries. As a result the construction of crossing protection in 1944 was limited to 268 crossings, including 643 protective units, which was a slight increase over 206 crossings in 1943, but was considerably less than the 530 crossings in 1942, or 1,224 crossings in 1937.

A point of interest is that 102 crossing gates were installed in 1944, as compared with 70 in 1943, thus indicating a trend to provide more complete protection at crossings on multiple-track lines, as well as on single track which handles high-speed trains. Of the 259 crossing protection projects installed in 1944 about 129 were paid for by the railroads, 87 by public tax funds, 43 jointly by the railroads and tax funds, and 10 by private companies.

As a part of the government plans to improve safety on highways it is to be expected that large programs of crossing elimination and protection will be scheduled after the war. As a result crossing protection should again represent a large proportion of the total signaling constructed each year.

In 1944 two large gravity-type freight classification yards were equipped with power switches and car retarders as compared with no such construction in the previous year. The projects completed in 1944 included the yards on the Burlington at Lincoln, Neb., with 38 switches and 14 retarders each 28 ft. long, and the westbound yard at Enola, Pa., on the Pennsylvania, including 44 switches and 21 retarders.

Spring Switches Decreased

The railroads installed 382 spring switches in 1944, as compared with 448 in 1943, and 284 in 1942. Thus the total for 1944, although less than for 1943, was larger than the average for the past several years. The continued interest in spring switches is occasioned by the fact that numerous train stops can be avoided by the installation of a minimum of materials. Of the spring switches installed in 1944 about 307 were at the ends of passing tracks, 21 at the ends of double track, 13 at junctions, and 36 at yard leads. Automatically-operated mechanical facing-point locks were installed at 115 spring switches in 1944. About 398 high signals and 155 dwarfs were installed as protection at spring switch layouts.

Electrical Potentials

(*Continued from page 57*)

used in connection with mica and glass insulation will aid materially in the maintenance of traction motors and other electrical equipment and will eventually improve the design and capacity of motors and generators.

High speeds and hard usage have increased the importance of attention to journal bearings and this situation has led to the development of hot journal alarm devices which are proving their value.

Shortage of copper and rubber plus increased electrical loads has increased the interest in capacitors. A report issued by the Electrical Section, Engineering Division, A. A R., shows what improvements they effect; and it would appear that in future power and distribution systems, some money will be taken out of copper and put in capacitors. Rubber shortages and the development of plastics have also resulted in the appearance of many new types of electrical insulation, some of which will have a permanent place in the fields of equipment design and distribution wiring.

ABANDONMENTS *decline*

Mileage of lines which were abandoned permanently during 1944 dropped sharply to become lowest total in any year since 1929. Total aggregated 640 miles

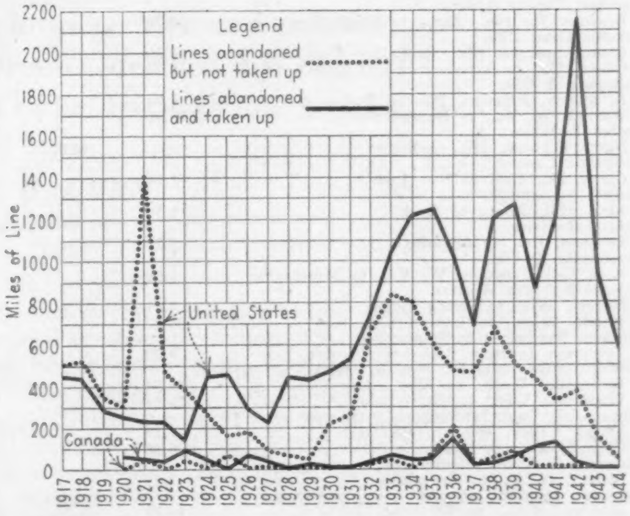
By GEORGE E. BOYD
Associate Editor

LAST year, for the first time in 13 years, the aggregate of railway lines abandoned in the United States reached a total of less than 1,000 miles and became the lowest aggregate of abandonments since 1929. In only eight of the 28 years since 1917, when the record of abandonments was started, have those for any year been less than they were in 1944. As usual, the abandonments that did occur last year were not confined to any particular section or locality, but were dispersed widely. There were no abandonments in Mexico and only one small one in Canada.

In 1944, a total of 640 miles of lines was abandoned in the United States, compared with 2,516 in 1942 and 1,096 in 1943. It is also significant of the trend of the times that the total abandonments for the year exceeded the total of new lines completed by 519 miles.

Mileage Abandoned by States in 1944 and Accumulated Total Since 1931

State	Mileage Abandoned in 1944.	Accumulated Abandonments Since 1931 Miles
Alaska	....	216.47
Alabama	11.83	289.97
Arizona	6.62	204.46
Arkansas	....	461.67
California	12.60	1,036.00
Colorado	9.10	699.72
Connecticut	....	129.75
Delaware	....	37.11
Florida	61.02	635.56
Georgia	13.42	516.55
Idaho	....	213.93
Illinois	....	676,60
Indiana	8.20	180.67
Iowa	....	841.94
Kansas	30.20	850.32
Kentucky	....	393.51
Louisiana	....	362.87
Maine	36.23	211.79
Maryland	....	96.70
Massachusetts	....	284.99
Michigan	67.69	1,100.23
Minnesota	2.10	416.13
Mississippi	21.25	299.59
Missouri	32.80	1,044.39
Montana	....	112.78
Nebraska	24.20	368.58
Nevada	....	307.29
New Hampshire	....	229.08
New Jersey	....	217.54
New Mexico	....	302.13
New York	11.82	606.05
North Carolina	37.70	327.06
North Dakota	....	23.88
Ohio	0.84	271.81
Oklahoma	17.93	704.87
Oregon	17.18	280.02
Pennsylvania	32.80	886.01
Rhode Island	....	17.39
South Carolina	2.31	341.15
South Dakota	....	236.14
Tennessee	....	480.61
Texas	119.51	1,398.96
Utah	....	308.70
Vermont	....	73.22
Virginia	....	405.61
Washington	15.34	330.35
West Virginia	14.20	314.79
Wisconsin	33.52	695.61
Wyoming	....	128.02
Total	640.41	20,568.57



There were no large individual abandonments, such as have occurred in some years previously, particularly in 1942 and 1943, when the demand for second-hand rail was so pressing. The largest single abandonment in 1944 was that of the International-Great Northern, between Navasota, Tex., and Madisonville, 43.47 miles. The second largest individual abandonment, also in Texas, involved the removal of 40.60 miles of line by the Missouri-Kansas-Texas, between De Leon and Cross Plains. Third place in the order of mileage taken up was held by the Jacksonville, Gainesville & Gulf, between Gainesville, Fla., and Emathala, 36.31 miles. This also represented the largest mileage involved in the abandonment of an entire railway. Fourth in rank with respect to mileage for a single abandonment was the St. Louis & Hannibal, between Bowling Green, Mo., and Hannibal, 32.80 miles, which was also the second largest abandonment of an entire railway during the year.

Eight entire railways were abandoned in 1944, two of which have already been mentioned. The third in the order of mileage was the Eastland, Wichita Falls & Gulf between Magnum, Tex., and Backwalker Junction, 26.62 miles; while the fourth in size was the Sheffield & Tionesta, extending from Sheriffs, Pa., to Sheffield, 13.10 miles. The remaining roads that went out of existence during the year were the California Central, between Chittenden, Cal., and San Juan, 7.94 miles, operation of which had been suspended since 1930; a logging road between McAfee, Miss., and Edinburg, which was owned by the Denkman Lumber Company, but which had been operated by the Canton & Carthage; the Monson, between Monson, Me., and Monson Junction, 6.16 miles; and the Ray & Gila Valley, from Ray Junction, Ariz., to Ray, 6.62 miles.

The foregoing list compares with 3 entire roads abandoned in 1943, with 14 in 1942 and 14 in 1941. In 1940 and 1939, 13 and 17 roads passed out of existence, bringing the total for the last six years to 69. It may be noted in this connection that the complete abandonment of several other roads is now under consideration, one or two of which have already applied to the Interstate Commerce Commission for the necessary authority.

The abandonments that are reported in any year include all lines abandoned permanently during the year, regardless of whether the tracks have been taken up at

Lines Abandoned in the United States, Canada and Mexico in 1944

United States	Lines abandoned and taken up miles	Lines abandoned but not yet taken up miles
Atchison, Topeka & Santa Fe		
Benedict Junction, Kan., to Virgil	30.20	....
Atlantic Coast Line		
Bonita Springs, Fla., to Collier City	23.00	....
Otisca, Ga., to Armsterdam	10.33	....
Baltimore & Ohio		
B. and S. Junction, Pa., to DuBois	4.94	....
Weston, W. Va., to Buckhannon	12.80	....
Boston & Maine		
North Berwick, Me., to Rigby	....	30.07
California Central		
Chittenden, Cal., to San Juan	7.94	....
Canton & Carthage		
Sand Hill, Miss., to Koch	1.50	....
Central Indiana		
Lebanon, Ind., to Advance	8.20	....
Chesapeake & Ohio		
Rock Lick Junction, W. Va., to Minersville	1.40	....
Chicago & North Western		
Mercer, Wis., to Shea's Spur	4.81	....
Winde, Mich., to Ladoga	24.37	....
Chicago, Burlington & Quincy		
Tecumseh Junction, Neb., to Beatrice	24.20	....
Chicago, Milwaukee, St. Paul & Pacific		
Eatonville, Wash., to Elbe	15.34	....
Woodruff, Wis., to Star Lake	16.84	....
Chicago, St. Paul, Minneapolis & Omaha		
Spring Valley, Wis., to Elmwood	7.19	....
Cornell, Wis., to Holcombe	4.68	....
Dansville & Mount Morris		
Sonyea, N. Y., to Groveland	3.25	....
Denkman Lumber Company		
McAfee, Miss., to Edinburg	10.75	....
Denver & Rio Grande Western		
Leadville, Colo., to Ibex	9.10	....
Eastland, Wichita Falls & Gulf		
Magnum, Tex., to Backwalker Junction	26.62	....
Great Northern		
At Duluth, Minn.	2.10	....
Gulf, Mobile & Northern		
Muldon, Miss., to Aberdeen	....	9.00
Eoline, Ala., to Blockton	....	11.83
International-Great Northern		
Navasota, Tex., to Madisonville	43.47	....
Jacksonville, Gainesville & Gulf		
Gainesville, Fla., to Emathala	36.31	....
Manistee & Northeastern		
Provemont, Mich., to Cedar City	10.68	....
Ruthardts, Mich., to Solon	3.07	....
Missouri-Kansas-Texas		
De Leon, Tex., to Cross Plains	40.60	....
Pottsboro, Tex., to Sadler	8.82	....
Monson		
Monson Junction, Me., to Monson	6.16	....
Nashville, Chattanooga & St. Louis		
V.S. 2289, Georgia, to V.S. 2452 + 22.5	....	3.09
New York Central		
Oran, N. Y., to Cazenovia	5.80	....
Pennsylvania		
Green Ridge branch, Pa.	0.80	....
Morgan Run branch, Pa.	3.24	....
Snowshoe branch, Pa.	0.48	....
Fallen Timber branch, Glasgow, Pa.	0.93	....
Sterling branch, Bakerlin, Pa.	0.83	....
Bellwood branch, Blandenburg, Pa.	0.22	....
Blairsville branch, Blairsville, Pa.	1.01	....
Scottsville, N. Y., to Garbutt	2.77	....
Mill Run branch, Deffenbaugh, Ohio	0.84	....
Cecil, Pa., to Bishop	....	1.10
Cecil, Pa., to Gladden	....	0.67
Pere Marquette		
Clare, Mich., to Harrison	16.58	....
Remus, Mich., to Weidman	12.99	....
Ray & Gila Valley		
Ray Junction, Ariz., to Ray	6.62	....
Reading		
Mt. Eagle branch, Tremont, Pa.	1.61	....
Helfenstein branch, Locust Dale, Pa.	3,87	....
St. Louis & Hannibal		
Bowling Green, Mo., to Hannibal	32.80	....
St. Louis-San Francisco		
Mead, Okla., to Madill	15.37	....
Ravia, Okla., to Randolph	2.56	....
Seaboard Air Line		
Albermarle spur, Charleston, S. C.	2.31	....
Terra Ceia spur, Sarasota, Fla.	1.33	....
At Kingsford, Fla.	0.38	....
Sheffield & Tionesta		
Sheriffs, Pa., to Sheffield	13.10	....
Southern		
Bushnell, N. C., to Fontana	14.00	....
Bryson, N. C., to Wesser	23.70	....
Southern Pacific		
Halvern, Cal., to Alvarado	1.33	....
Lick, Cal., to Alamitos	0.08	....
West Anaheim to Los Alamitos	0.14	....
Alhambra, Cal., to Pasadena	0.02	....
San Bernardino, Cal., to Colton	3.09	....
Union Pacific		
Kent, Ore., to Shaniko	17.18	....
Total	584.65	55.76
CANADA		
Canadian National		
Linton, Que., to LaTuque	10.03	....

Following the record abandonment of 2,516 miles of railway lines in 1942, which was stimulated in part by an insistent demand for rail for use on war projects, there was a marked recession in the elimination of rail facilities during the following year, and this trend has continued through 1944. This article gives statistics total abandonments since 1916 and abandonments by states since 1931.

the end of the year. If the tracks have not been removed, the lines are not included in the reports for later years when they are actually removed.

Abandonments were not recorded prior to 1917, primarily because such lines as were abandoned were not important, besides which they occurred somewhat sporadically and in sparsely-inhabited country. In 1917, however, a total of 942 miles was abandoned permanently, since which time abandonments have ranged annually from 282 miles in 1927 to 2,516 miles in 1942. During the entire 28-year period ending with 1944, a total of 30,973 miles of lines has been abandoned, an average of more than 1,100 miles a year. During the same period only 10,851 miles of new lines have been constructed, leaving a net decrease for the period of 20,122 miles of road, an average net reduction of more than 700 miles a year.

Of equal, but somewhat wider, interest with the mileage abandoned by individual roads and the total for all roads, is the distribution of the abandonments by states and regions, for the states themselves are vitally concerned with respect to the adequacy of transportation within their borders, as well as to the taxable property that is thus lost to them. Texas had the largest aggregate abandonment of all of the states in 1944, a total of 120 miles having been eliminated during the year. Michigan dropped to second place with 68 miles abandoned; and Florida followed closely with 61 miles; while North Carolina ranked fourth with 38 miles abandoned during the year. For the total period of 13 years ending with 1944, Texas remained in first place with 1,399 miles abandoned; Michigan also remained in second place, with 1,100 miles abandoned during the same period; while Missouri rose to third place with total abandonments of 1,044 miles; and California dropped from third to fourth rank with aggregate abandonments of 1,036 miles of lines.

During the same 13-year period, a total of 20,569 miles was abandoned in the United States and Alaska. Of these there were in the New England states, 946 miles; North Atlantic states, 1,843; Southeastern states, 4,004; Middle Western, 5,402; Northwestern states, 1,414; Southwestern states, 4,787 miles; and the Pacific Coast states, 1,955.

Since 1932, abandonments by the Canadian roads have ranged from 11 to 399 miles, except in 1943, when less than one mile was abandoned, the aggregate for the 13-year period being 1,177 miles.

Miles of Lines Abandoned in the United States Since 1916

Year	Miles	Year	Miles
1917	942	1931	795
1918	959	1932	1,452
1919	637	1933	1,876
1920	536	1934	1,995
1921	1,626	1935	1,843
1922	677	1936	1,523
1923	513	1937	1,140
1924	693	1938	1,897
1925	606	1939	1,783
1926	457	1940	1,299
1927	282	1941	1,509
1928	512	1942	2,516
1929	475	1943	1,096
1930	694	1944	640

T. & T. *construction increased in 1944*

More long-distance telephone service and printing telegraph as well as circuits derived by carrier equipment—Radio used to bridge pole line breaks

By ***JOHN H. DUNN***
Associate Editor

WAR-TIME transportation has resulted in an increasing demand for more and more railroad telegraph and telephone communication, and this demand has been met by using existing facilities more efficiently as well as by installing new circuits and equipment as fast as possible without hindering the war program.

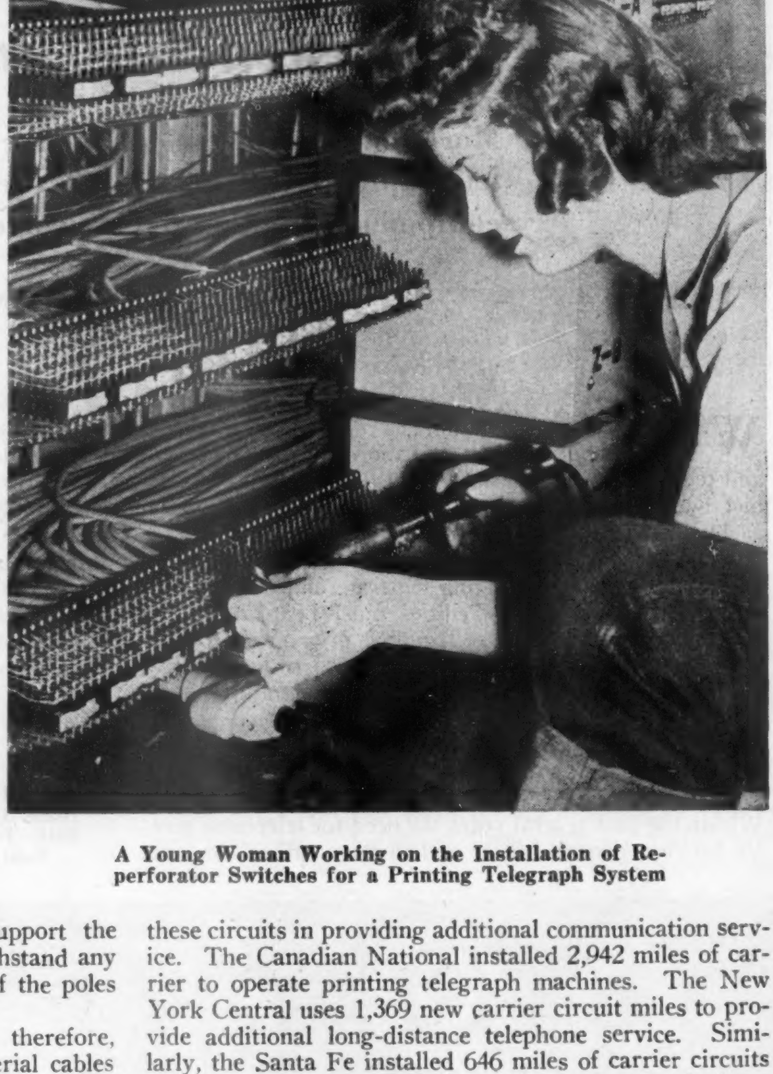
Communication serves four separate and distinct uses on a railroad, and the facilities must be planned and operated accordingly. The handling of train orders and information concerning the movement of trains requires separate circuits and apparatus, either telegraph or telephone. The transmission of messages between general offices, division headquarters and stations is generally handled by telegraph, the manually-operated Morse telegraph being replaced rapidly by printing telegraph. Within the past several years the need for telephone service between general offices and division offices has been met by the installation of long-distance telephone circuits. Of considerable importance, also, is the local service between various stations, a service in which the telegraph has rapidly given way to the telephone.

During the first two years the United States was in this war the use of copper for other than military purposes was seriously restricted so that new copper line wire was available only on those territories where a lack of communication was hampering railroad operations. This restriction of copper eased a bit in 1944, but there has been such a shortage of linemen that construction has been

As a Means for Handling More Telegrams the Railroads Installed 140 Printing Telegraph Machines in 1944—This Photograph Shows the Printing Telegraph Equipment in Denver Offices of the Rio Grande

limited. A review of the three war years shows that in the United States and Canada the railroads installed 12,634 miles of new copper line wire in 1942; it dropped to 3,623 in 1943, but in 1944 the total increased to 7,037 miles.

For many years the railroads have used simplexing, duplexing, etc., by means of which a line wire circuit can be used to transmit two messages simultaneously. In recent years the carrier system has been developed by means of which a number of different high-frequency wave bands can be superimposed on a line circuit to transmit several different messages simultaneously. The greater the number of messages to be handled simultaneously, the more complicated the carrier apparatus and the transposition of line wires to prevent interference. In brief, the carrier system has been a great help to the railroads in using existing line wires to derive additional circuits, or rather channels as they are known. In 1944 the railroads used carrier to derive 13,856 circuit miles, as listed in one of the tables.



A Young Woman Working on the Installation of Reperforator Switches for a Printing Telegraph System

"Chief Worry at Present"

Under war-time conditions the chief worry is to secure enough good copper wire to make up a line circuit on which to superimpose carrier. In the meantime, six-conductor coaxial cables have been developed and installed to a limited extent, by means of which 960 messages can be transmitted simultaneously by the carrier equipment. Stranded steel messengers which support the aerial cable can be made strong enough to withstand any sleet load and to hold the cable intact even if the poles are broken down.

A glance into the future would indicate, therefore, that the tendency will be to install coaxial aerial cables to be used with carrier apparatus. A post-war problem for the railroads is to decide whether to install or take over the ownership of large mileages of open line wires which may become a white elephant within a comparatively few years.

How the Railroads Are Using Carrier

One of the tables lists the mileages of circuits derived by carrier installed in 1944, and the following discussion explains a few typical examples of the applications of these circuits in providing additional communication service. The Canadian National installed 2,942 miles of carrier to operate printing telegraph machines. The New York Central uses 1,369 new carrier circuit miles to provide additional long-distance telephone service. Similarly, the Santa Fe installed 646 miles of carrier circuits which was assigned for additional long distance telephone service, and the Canadian Pacific did the same with 4,232 new miles of carrier channels. On the Illinois Central the installation of three-channel carrier on 759 road miles supplies 1,883 circuit channel miles which was assigned to long-distance telephone service.

In order to utilize existing line wire circuits more efficiently the Morse telegraph has rapidly been replaced by printing telegraph, the line circuits assigned to this service in 1944 being 17,068 miles, which is the greatest

Principal Increases in Communication Plant Facilities on the Railroads in the United States and Canada During 1944, as Compared with 1943 and 1942

	1944	1943	1942
Miles of new or rebuilt pole line:			
Railroad owned	316.0	3,536.1	3,374
Commercially owned	2,831.4	2,248.8	3,353
Jointly owned	1,771.4	2,171.6	1,873
Totals	4,918.8	7,956.5	8,600
Mileage of new copper line wire:			
Railroad owned	5,447.9	1,657.5	8,770
Commercially owned	1,589.6	1,965.8	3,864
Totals	7,037.5	3,623.3	12,634
Gross increase in miles of road dispatched by telephone	2,318.1	672.2	2,153
Increase in miles of long-distance telephone circuits	21,178.3	15,461.9	9,763
Increase in mileage of printing telegraph circuits	17,068.9	11,980.6	13,840
Number of new printing telegraph machines	140.0	186.0	160
Increase in circuit miles of new carrier-current systems	13,855.6	13,914.8	18,372

New Printing Telegraph Placed in Service During 1944

Railroad	Miles of Circuits	No. of Machines
A. T. & S. F.	2,444.0	8
B. & O.	428.0	8
C. B. & Q.	544.0	13
C. M. St. P. & P.	1,383.0	6
C. N.	3,454.0	28
C. P.	630.0	10
C. V.	368.0	3
D. & H.	0.5	1
D. & R. G. W.	129.3	2
M. P.	413.0	5
N. P.	3,409.0	8
N. Y. C.	273.0	6
N. Y., N. H. & H	75.0	1
Penna.	297.7	16
Reading	111.0	4
St. L. S. W.	75.0	2
Southern	359.4	3
S. P.	2,262.0	4
T. & N. O.	210.0	5
W. P.	203.0	7
Totals	17,065.9	140

in history, being more than the 11,980 miles in 1943, the 13,840 in 1942 and the 12,217 in 1941. Because of the need for telegraph printing machines in military services the supply to railroads was seriously restricted, only 140 such machines being placed in service in 1944 as compared with 186 in 1943, and 160 in 1942.

Because of a shortage of operators capable of using Morse telegraph various roads have installed telephone

Circuit Mileage Derived by Carrier Installations During 1944

Railroad	Circuit Miles
A. T. & S. F.	646.8
C. B. & Q.	232.0
C. & E. I.	126.0
C. M. St. P. & P.	187.0
C. N.	1,391.0
C. P.	2,173.0
C. R. I. & P.	357.0
D. & R. G. W.	129.3
Erie	119.5
F. E. C.	330.0
G. N.	182.0
I. C.	1,209.0
K. C. S.	111.0
L. & N.	172.0
M. St. P. & S. S. M.	386.0
N. P.	105.0
N. & W.	121.0
N. Y. C.	1,325.0
Penna.	620.0
S. A. L.	141.4
Southern	971.0
S. P.	480.0
T. & N. O.	380.0
T. & P.	267.0
U. P.	1,415.9
Wabash	278.0
Total	13,855.6

New and Rebuilt Pole Line Construction and New Line Wire Installations in the United States and Canada During 1944

	New or Rebuilt Pole Lines			Mileage of New Copper Wire	
Railroad	Railroad Owned	Commercially Owned	Jointly Owned	Railroad Owned	Commercially Owned
Alton	..	57.9	..	..	..
A. T. & S. F.	..	..	355.5	1,320.2	10.0
B. & M.	..	35.0	..	..	..
B. & O.	0.5	..	..	304.0	..
C. B. & Q.	192.0	..	..	10.0	..
C. & E. I.	..	..	64.0	27.0	..
C. G. W.	..	45.0	..	..	..
C. N.	..	..	554.0	371.0	983.0
C. N. S. & N.	..	..	..	14.5	..
C. & O.	144.2	..	..	21.2	..
C. P.	298.0	..	..	816.0	14.0
C. R. I. & P.	..	49.0	..	228.0	..
C. & S.	..	20.0	..	50.0	..
C. V.	..	..	..	63.0	..
D. & H.	41.5	7.0	..	74.0	..
D. L. & W.	..	..	73.4	..	..
D. M. & I. R.	118.6	..	..	..	..
D. S. S. & A.	..	..	21.3	..	..
E. J. & E.	18.5	..	..	..	..
Erie	13.5	59.0	7.0	6.0	..
G. N.	451.0	..	..	440.0	..
I. C.	..	186.8	..	..	..
I.-G. N.	..	..	198.0	..	20.0
K. C. S.	..	133.3	..	111.0	..
L. & A.	..	31.0	..	..	..
L. & H. R.	5.0	..	..	2.0	..
L. & N.	850.0	..	..	..	..
L. & N. E.	4.5	..	..	9.0	..
L. V.	25.0	..	..	210.0	..
M-K-T.	..	8.8	..	..	..
Monongahela	45.0	..	..	..	..
M. P.	40.0	309.8	205.0	142.8	60.0
M. St. P. & S. S. M.	197.0	..	114.3	..	..
N. C. & St. L.	68.0	..	..	..	..
N. O. T. & M.	..	..	..	4.0	40.0
N. P.	30.0	..	..	45.0	5.0
N. & W.	..	52.0	..	..	..
N. Y. C.	..	373.0	43.0	49.0	..
N. Y. C. & St. L.	..	..	74.0	..	..
N. Y., N. H. & H.	..	167.0	..	17.0	..
P. E.	1.6	..	..	6.4	..
Penna.	431.5	..	61.9	206.0	..
P.-R. S.	74.6	..	..	..	..
P. & S.	16.0	..	..	..	..
Reading	9.5	19.2	..	..	..
St. L.-S. F.	..	78.0	..	..	..
St. L. S. W.	..	183.0	..	126.0	..
S. A. L.	..	191.6	..	..	374.6
S. I.	50.0	..	..	..	..
Southern	..	..	..	333.8	..
S. P.	..	556.0	..	257.0	..
T. & N. O.	..	50.0	..	170.0	..
T. R. R. A. of St. L.	4.5	..	..	..	..
U. P.	..	..	..	14.0	..
Virginian	30.0	..	..	..	..
Wabash	..	72.0	..	..	83.0
W. M.	..	147.0	..	..	..
Totals	3,160.0	2,831.4	1,771.4	5,447.9	1,589.6

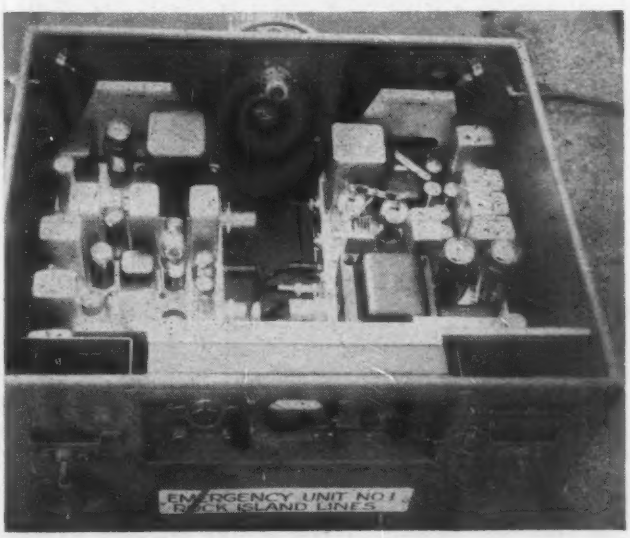
New Mileage of Telephone Train Dispatching and Long-Distance Telephone Circuits Placed in Service in 1944

Railroad	New Miles of Road Dispatched by Telephone	Miles of New Long-Distance Telephone Circuits
A. T. & S. F.	124.0	646.0
B. & O.	453.0	..
C. B. & Q.	213.0	113.0
C. & E. I.	..	54.0
C. M. St. & P. & P.	..	33.5
C. N	304.0	1,561.0
C. & O.	6.6	..
C. P.	267.0	4,232.0
C. R. I. & P.	114.0	489.0
C. & S.	25.0	..
D. & H.	103.0	113.0
D. & R. G. W.	17.2	604.4
F. E. C.	..	330.0
G. N.	..	402.0
I. C.	..	2,338.0
K. C. S.	111.0	..
L. & N.	..	172.0
N. P.	..	105.0
N. Y. C.	..	1,369.0
P. E.	0.6	3.2
Penna.	..	453.5
St. L. S. W.	63.0	..
S. A. L.	..	187.3
Southern	261.7	155.0
S. P.	..	5,849.5
T. & N. O.	..	380.0
T. & P.	255.0	..
U. P.	..	1,415.9
Wabash	..	172.0
Totals	2,318.1	21,178.3

train dispatching on extended mileages, a total of 2,318 miles being so equipped in 1944 as compared with 672 miles for 1943. The Baltimore & Ohio installed telephone dispatching on 453 miles, the Canadian National on 304 miles, the Southern on 261 miles, and the Texas & Pacific on 255 miles.

In 1944 the Rock Island, in co-operation with the Galvin Manufacturing Corp., developed special radio equipment to be used to bridge long wire-line gaps that might be caused by the destruction of extended sections of pole line by sleet storms or floods. In April a storm destroyed several long sections of pole lines in western Kansas. The radio sets were set up to bridge a gap of 27 miles between Colby, Kan., and Seldon for two weeks while the pole line was being rebuilt.

The use of radio for regular or emergency service between offices is a subject which has been discussed for many years but the restrictions in the assignment of wave lengths has discouraged actual installations. Now that the development of high-frequencies has made more wave length available, perhaps some may be used for railroad radio service. This phase of the subject is to be decided by the Federal Communications Commission.



In 1944, the Rock Island Developed Radio Equipment to Bridge Pole Line Gaps Caused by Sleet Storms

MOTOR *transport beats war trials*

Overcomes shortages of men, materials and equipment to carry on for the duration—rubber critical problem

Most Motor Equipment Is Out of Date and New Vehicles Are Increasingly Harder to Obtain Until After the War

Rail-highway co-ordinated service has met the challenge thrown down by restrictions, the draft and increasing demands of a nation at war. Called upon to do a "super" job despite a steadily-dwindling supply of drivers, mechanics and tires, and a strictly rationed output of gasoline and oil, this industry has faced the crisis thrust upon it, and within a comparatively short time has geared its efforts and operations to meet greater demands and possibly even greater shortages before peace comes to the world.

By *HARRY E. MEASON*
Associate Editor

RAIL-HIGHWAY co-ordinated service, under Office of Defense Transportation restrictions and curtailed by a lack of man-power and strictly rationed supplies of gasoline, tires and vehicles, has nevertheless managed to carry on with creditable showing during the year just passed. While figures available indicate that restrictions governing the manufacture of buses and trucks have been lessened to a considerable extent, and at least one transcontinental bus line was granted permission to purchase a total of 627 new buses, the acquisition of tires and fuel continue to be the chief headaches of truck and bus firms.

Motor carriers last year reported an increase in business over 1943 which was not in proportion to the natural increase in business brought about by war conditions. A report issued by the American Trucking Association, Inc., in November and submitted by the carriers themselves, showed that in August, 1944, 2,231,005 tons of freight were transported as against a total of 2,214,047 during August of the previous year, an increase of only 0.8 per cent. A significant reason for this scanty increase is seen in a report of Guy A. Richardson, assistant director of O. D. T.'s Highway Transport department, in which it was disclosed that while truckers and bus operators had asked for an allocation of 165,000 tires per month for essential use only, the largest monthly allotment made was for 73,000, less than half the total demanded by O. D. T.

O. D. T. Assists

Despite this failure to aid in procuring much-needed equipment, the O. D. T. has indicated its willingness to aid truckers and rail-highway co-ordinated service whenever possible. Indicative of this was a permission granted to the Burlington Transportation Company (a subsidiary of the Chicago, Burlington & Quincy) to

open two additional trucking routes and enjoy a little more freedom in the operation of five other routes.

The first new route granted was one designed to connect with the company's route between Chicago and Omaha, Neb., at Sheffield, Ill., and extend to the Tri-Cities of Rock Island, Ill., Moline, and Davenport, Iowa. The Commission's favorable action was based on the fact that it would shorten by 25 miles the route between Chicago and the Tri-Cities. The second new route granted was between St. Joseph, Mo., and Clarinda, Iowa, a distance of 77 miles. The permission for this carried the usual stipulation that the trucking operation should remain auxiliary to the Burlington rail service, including a so-called "key point" condition forbidding the handling by truck of traffic moving between specific points.

In June of last year the O. D. T. authorized six common carrier truck operators, operating from points in California to destinations in Oregon and Washington to substitute rail for motor vehicle service. This permission was granted in order to utilize equipment more fully and reduce traffic congestion.

The Rock Island Motor Transit Company (a subsidiary of the Chicago, Rock Island & Pacific) was another organization to benefit by O. D. T. relaxation of existing rules. In this case the O. D. T. authorized the subsidiary and its parent railroad to substitute certain motor carrier service for l.c.l. rail service in the transportation of intrastate freight between the Minneapolis-St. Paul area and the Iowa state line.

Shortages Encountered

Many motor transport companies have been obliged to change their operating methods drastically in order to meet difficulties brought about by war conditions, such as the shortages of tires, drivers, mechanics, etc. Admittedly tires are their chief worries and many interesting methods were developed as a means of making rubber last as long as possible. One of the most effective was established by one company and consisted of a newly-created method of inspecting tires for air pressure irregularities. Under this set-up inspectors were detailed at various terminals and stops to check every tire on every vehicle to determine whether or not the tires were carrying the proper amount of air. In addition, drivers were required to make the same check at regular intervals. In addition to this, drivers were impressed with the necessity of maintaining the correct speed as required by company regulations, and loads out of the major terminals were regulated so that no loading capacity rules were violated. As a result of this system, company officials reported, no more than four vehicles at any one time were "on the jacks" due to tire trouble. This company, however, admitted having a plentiful supply of rubber when restrictions began, and declared that this supply has been considerably augmented with re-caps.

Although reporting a surplus of drivers, this same organization has already experienced a serious shortage of mechanics due to the draft, and added that it had become necessary to employ women ticket agents and office help. So far, no means have been developed to offset the scarcity of mechanics.

Another company has met the shortage of critical materials and help by the simple process of canceling schedules and reducing service in many parts of the country, but chiefly in California. This firm estimates that approximately 30 per cent of its drivers have been drafted into the armed services, and as a means of counteracting that shortage, it has established training courses for drivers. These consist of a two-week training period and then strict supervision on the road for a longer period. The road supervision is conducted under what is termed a "master operator set-up" in which veteran drivers spend practically all their time traveling on vehicles being operated by new men and talking things over with the new driver in the event his operation is considered less than perfect.

That Interstate Commerce Commission rulings form another brand of headache for operators is seen in a recently handed-down decision of the I. C. C. concerning the Southwestern Greyhound Lines' attempt to acquire Arkansas Motor Coaches, Limited, Inc. After the prospective buying company had arranged for capital stock changes to remove the basis of an I. C. C. finding that it was "affiliated with a carrier by railroad," Southwestern failed to convince the Commission that acquisition of the properties of Arkansas Motor Coaches, Limited, Inc., would be consistent with the public interest, and so the application was docketed.

In a prior report which delved into the company's history, the I. C. C. found that 13⅔ per cent of Southwestern's class A voting stock was owned by the Southern Pacific and one of its motor carrier subsidiaries, the Southwestern Transportation Company; and that two members of Southwestern Greyhound's board of directors were officers of the Southern Pacific while another was an officer of the St. Louis-Southwestern, a "subsidiary" of the S. P. Because of these and other circumstances, the prior report took the position that the applicant was affiliated with a carrier by railroad; and that it had not made the special showing required in section 5 that the proposed transaction would not unduly restrain competition and would enable the railroad to use the service by motor vehicle to public advantage in its operations.

At the further hearing it was shown that all S. P. and Southwestern Transportation Company holdings of Southwestern Greyhound class A voting stock had been exchanged with the Greyhound Corporation for class B non-voting shares; that the operating agreement between S. T. C. and S. G. had been modified; and the S. P. and Cotton Belt officers had resigned from S. G.'s board of directors. Thus the applicant took the position that it was no longer affiliated with a carrier by railroad within the meaning of section 5 (6).

Indicative of the difficulty of satisfying the I. C. C., is the Commission's findings in reference to the "not consistent with the public interest" clause in which that body found it "unnecessary to determine whether Southwestern Greyhound or Greyhound (corporation), or both, are or are not affiliated with a railroad within the meaning of section 5 (6)," adding that "in considering the application without applying the proof requirements of the proviso of section 5 (2) (b), we are not to be understood as determining such question or affiliation."

Future Bright

These facts indicate that rail-highway co-ordinated service is having its troubles under war-time conditions, but is, nonetheless, doing as good a job as possible of supplementing the railways in supplying badly-needed transportation. There are many rumors as to legislation adversely affecting such transportation after the war. It is, however, a type of flexible service which the shippers are sure to demand when peace comes and, if it is subjected only to the normal restrictions, it is sure to grow in the post-war era.

Equipment Prices

THE source of unit prices of motive power and rolling stock, tabulated herewith, is the decisions of the Interstate Commerce Commission, made public in granting railroads authority to issue equipment trust certificates. The weight of the equipment is usually not shown in the information made public by the I. C. C., but is supplied by *Railway Age* from other sources, where the equipment for which trust certificates are authorized can, with reasonable assurance, be identified with that ordered, and for which *Railway Age* has the weights and other descriptive information.

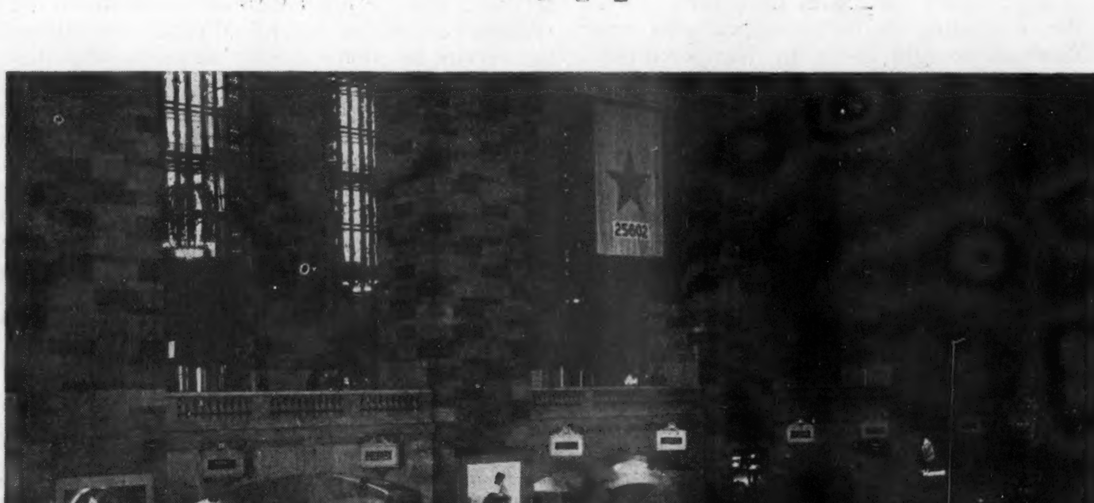
Not all equipment ordered is financed by the sale of equipment trust certificates—and it is not possible to identify with *Railway Age* statistics of orders all equipment for which certificates are issued. Consequently, the prices as shown in the accompanying tabulations represent only a fraction of the entire market. However, the data are factual and, probably, are representative. In any event, they cover a substantial portion of equipment purchased, and are derived, primarily, from the only official source of such information.

Locomotive Prices

No.	Type	Service	Weight lb.	Tractive Force—lb. or hp.	Unit Price
10	2-6-6-6	Frt.	724,500	110,200	$278,174
10	2-6-6-6	Frt.	724,500	110,200	281,183
5	2-6-6-6	Frt.	......	......	283,312
22	Diesel-elec.	Sw.	230,000	1,000 hp.	78,500
10	4-8-4	Frt.	......	......	194,230
6	Diesel-elec.	Frt.	923,000	5,400 hp.	509,000
6	Diesel-elec.	Frt.	......	5,400 hp.	498,400
1	4-8-4	Pass. & Frt.	465,000	62,500	255,000
20	Diesel-elec.	Sw.	......	1,000 hp.	79,000
10	Diesel-elec.	Sw.	......	600 hp.	60,000
1	Diesel-elec.	Pass.	......	6,000 hp.	522,000
15	2-8-4	Frt.	......	......	171,479
18	2-10-4	Frt.	......	......	180,000
7	2-8-4	Frt.	......	......	170,185
5	2-8-4	Frt.	......	......	180,160
5	Diesel-elec.	Frt.	......	5,400 hp.	482,924
20	4-6-6-4	Frt.	......	......	285,740
5	4-8-8-4	Frt.	......	......	319,600
10	4-8-4	Ftr. & Pass.	......	......	214,840

Freight Car Prices

No.	Type	Construction	Capacity lb.	Unit Price
750	hopper	composite	100,000	$2,985
500	box	composite	100,000	3,652
250	gondola	composite	100,000	3,453
1000	gondola	composite	140,000	3,294
500	hopper	steel	100,000	2,632
100	flat	composite	140,000	3,611
1250	hopper	steel	100,000	2,571
1250	hopper	steel	100,000	2,593
1250	hopper	steel	100,000	2,579
1250	hopper	steel	100,000	2,669
2000	box	composite	100,000	3,457
1000	box	steel	100,000	2,750
500	box	steel	100,000	3,250
35	M.T. gondola	......	140,000	4,000
25	caboose	steel	......	3,760
600	hopper	steel	100,000	2,599
200	box	steel	100,000	3,314
75	hopper	composite	100,000	2,753
2000	box	steel	110,000	2,996
1000	box	steel	110,000	3,500
1000	box	steel	110,000	3,467
1000	hopper	steel	110,000	2,431
500	gondola	steel	100,000	2,550
300	box	steel	100,000	3,285
25	hopper	steel	140,000	4,481
300	box	steel	100,000	4,000
200	box	steel	100,000	3,800
100	D.E. gondola	composite	140,000	3,597
100	flat	composite	140,000	3,607
200	box	steel	100,000	3,217
200	hopper	steel	140,000	3,276
100	caboose	steel	......	7,034
500	box	steel	100,000	3,042
500	H.S. gondola	steel	100,000	2,471



A Recent Photograph of N. Y.'s Grand Central Terminal

Note total on New York Central service flag, and new type three-dimensional advertising displays, which were described on page 456, September 16, *Railway Age*.

GENERAL NEWS

Board to Scrutinize Air Property Rates

Orders general investigations; proposes 47 per cent cut in mail pay

The Civil Aeronautics Board on December 30 issued an order instituting a general investigation of the rates, fares and charges for the transportation of property by all domestic air carriers, under which it may look into the reasonableness of rate levels, or of any individual or joint rate, or examine any discriminatory or preferential features of property rates.

At the same time the board issued orders directing four principal air carriers to show cause why their mail rates should not be reduced from 60 cents to 32 cents per ton-mile of mail carried. These orders were served on American Airlines, Eastern Air Lines, Transcontinental & Western Air, and United Air Lines.

In a statement of "tentative findings and conclusions" accompanying the show cause orders, the board said: "An important factor which must be taken into consideration in establishing the mail rate . . . is that our estimates of respondent's passenger and property revenues may be subject to readjustment as a result of rate reductions. The tentative rate of mail compensation, therefore, should reflect this possibility. Since it is difficult to weigh such factors precisely, the tentative rate which we establish may be subject to adjustment either upwards or downwards . . . when our final order in this proceeding is issued." The respondents to the show cause orders are allowed 20 days to file notice of objections and an additional 25 days to file written answers and exhibits.

With respect to the general investigation, the board said: "It appears appropriate at this time to commence an investigation of rates for the transportation of property by air. Air express and air freight are aspects of air transportation which increasingly will demand the close attention of the air carriers and government authorities alike in order that no impediments will stand in the way of their rapid and economically sound growth. Numerous and difficult problems concerning rates for the carriage of property by air await investigation and solution."

Johnson's Year-End Statement

Included in an omnibus year-end release of statements by military leaders and heads of government war agencies distributed by the Office of War Information were the following remarks by Colonel J. Monroe Johnson, director of the Office of Defense Transportation:

"American transportation, in the year now ending, has accomplished another miracle.

"Surpassing their record of previous war years, our transportation lines have kept vitally needed war supplies flowing to the front, have transported the biggest Army in American history and, meanwhile, have cared for essential civilian needs with comparatively little dislocation.

"Railways, truck, bus and air lines, waterways, pipelines; men and women in all these fields have contributed mightily to this result. A few figures speak volumes; more than a trillion ton-miles of freight, and more than 300 billion passenger-miles have been transported in 1944.

"With two wars raging at once the months ahead will bring increases in the need for war supplies and the movement of military personnel. With far from enough equipment and with a scarcity of skilled manpower, the transportation lines must and will continue to carry the load . . . for the men and materials for Victory must move. Greater burdens lie ahead. 1945 challenges transportation to even greater achievement, another more difficult miracle."

R. C. C. Distribution

The Railroad Credit Corporation on January 31 will make a liquidating distribution of one per cent of its fund as of December 31, 1944, amounting to $724,268.41, according to President E. G. Buckland.

Of this amount, $658,831.75 will be paid in cash and $65,436.66 will be credited on carriers' indebtedness to the corporation. This will bring the total amount distributed to $67,547,446.87, or 92 per cent of the original fund contributed by carriers participating in the "marshalling and distribution plan" of 1931. Of this total, $38,943,405.10 will have been returned in cash and $28,604,041.77 in credits.

Burlington's Veteran-Rehiring Program—a Correction

In the item, Burlington Makes Plans for Rehiring Service Men, which appeared on page 940 of the *Railway Age* of December 16, it was erroneously stated that as a pre-requisite of re-employment, the former railroad employee now in military service must apply for the position within 48 hours after his discharge. Under the amended Selective Training and Service Act of 1940, all employees now in military service are allowed 90 days in which to apply for their former positions. The 90-day period is in effect on the Burlington and all other railroads.

Transport of Race Horses Is Banned

O. D. T. Director Johnson's order a further move to conserve badly needed space

The transportation of race horses and racing dogs by any form of land transportation was prohibited December 30 by Interstate Commerce Commission Service Order No. 271—applying to railroads and express companies and owners or lessees of railroad or express cars, and also to common carrier and contract truckers—and by an order of Director Johnson of the Office of Defense Transportation, applying to "all other" motor vehicles, including those privately owned.

This action, applying to intrastate, interstate and foreign commerce was taken, it was indicated, to implement the request of Justice Byrnes, director of the Office of War Mobilization and Reconversion, that all racing of horses and dogs be discontinued because of its adverse effect on the manpower and transportation situations (noted in *Railway Age* of December 30, 1944, page 1004). Director Byrnes specifically asked the O. D. T. to "take such steps as fall within its power to prevent the use of critical transportation for this purpose."

Colonel Johnson, in announcing the order, said: "The objective of Justice Byrnes' request to cancel racing, after January 3, is to conserve transportation, critical materials and manpower. The response to the request has been excellent and exemplifies the inherent good sportsmanship of Americans. However, it appears that a very small minority are planning to circumvent the spirit of Justice Byrnes' request. Today's action by the Office of Defense Transportation is designed to prevent just that." It was pointed out in other quarters that the actual or prospective opening of race tracks just across the borders of Mexico and Canada may have been the immediate cause of this ban on the shipment of horses and dogs.

It was indicated that permits for the movement of these animals would be granted by the I. C. C. or the O. D. T. in instances where such transportation "does not conflict" with Justice Byrnes' purpose to stop racing. This was generally interpreted to mean that owners of such animals now located at race tracks would be permitted to ship them to their home stables or similar destinations.

The commission's order expires January 3, 1946, unless otherwise directed.

Seek Dismissal of Anti-Railroad Suit

Western lines want all or part of complaint thrown out, plus particulars

In a three-pronged reply, filed in the United States District Court at Lincoln, Neb., on January 2, western railways and the Association of American Railroads, defendants in the Government's antitrust suit, challenged the right of the Department of Justice to bring suit. A civil complaint, charging violations of Sections 1 and 2 of the Sherman Antitrust Act., was filed by the Department of Justice at Lincoln on August 23, naming as defendants the Association of American Railroads and its officers and members of its board of directors, the Western Association of Railway Executives, 47 western railroads and their chief executives, J. P. Morgan & Co., Inc., Kuhn, Loeb & Co., and 31 other individuals alleged to have been associated at one time or another with the violations charged.

Asks All or Partial Dismissal—The motions filed on January 2, are on behalf of the defendants except J. P. Morgan & Co., Inc., Kuhn, Loeb & Co., Frederick E. Williamson, Robert C. Vaughn and Thomas W. Lamont. The motions ask the court (1) to dismiss the action and, in the alternative, (2) to strike or dismiss parts of the complaint and (3) for a bill of particulars.

In support of its motion to dismiss, the defendants contended that Congress on June 11, 1942, passed Public Law No. 603 which suspended antitrust prosecution of industries wholeheartedly engaged in concerted and co-operative activities requisite to winning the war. Specifically, the motion asserted:

"This action is a single and indivisible civil action under the antitrust laws of the United States and is with reference to joint action by common carriers, or their respective representatives, through rate bureaus, rate conferences, or other similar carrier organizations, in the initiation and establishment of common carrier rates, fares, and charges, and carrier regulations and practices pertaining thereto.

Legal Basis Challenged—"Defendants' said joint action, if any, in the initiation and establishment of rates, fares and charges, and carrier regulations and practices pertaining thereto, has been taken subject to and in compliance with Certificate No. 44, and with the 'Regulations for Rate Conferences' annexed to and made a part of said Certificate No. 44, which was issued on March 20, 1943, by the chairman of the War Production Board pursuant to Section 12 of Public Law No. 603, 77th Congress (56 Stat. 357, 50 U. S. C. Par. 1112), and said civil action is with reference to such alleged joint rate action and may not be commenced under the antitrust laws of the United States by reason of the express prohibition against the same contained in Section 12 of said Public Law No. 603, and therefore the complaint fails to state a claim upon which relief can be granted, this Court is without jurisdiction of the subject matter, and plaintiff is without capacity to sue herein."

In their alternative motion the defendants ask the Court "to strike or dismiss from the complaint each and every paragraph, subparagraph, word and allegation thereof which makes reference to the initiation and establishment of common carrier rates, fares and charges and carrier regulations and practices pertaining thereto. In Section I of this motion the defendants ask for the striking of 37 paragraphs and subparagraphs of the complaint on the grounds that: "No civil action under the antitrust laws may be commenced with reference to any act or thing, or the omission to do any act or thing, stated in the paragraphs, subparagraphs, words and allegations of the complaint described and specified in the foregoing motions and herein moved to be stricken, and therefore such paragraphs, subparagraphs, words and allegations fail to state a claim upon which relief can be granted, this Court is without jurisdiction of the subject matter thereof, and plaintiff is without capacity to sue thereon."

As further grounds they mention Section 12 of Public Law No. 603, 77th Congress (56 Stat. 357 U. S. C. Par. 1112); and War Production Board's Certificate No. 44 on interstate commerce commission rate conference regulations. Section II, III and IV of the motion to strike deal with several other parts of the complaint.

Motions for Bill of Particulars—In the event the motions to dismiss the action are denied, the answer continues, the defendants move the Court for a bill of particulars with respect to certain words and allegations of the complaint because certain matters referred to in the complaint are not stated or charged with sufficient definiteness to enable the defendants properly to prepare their several responsive pleadings. Specifically, the bill of particulars asks for the date, place, period, names of persons and other information with respect to alleged "combination and conspiracy to monopolize, unlawful monopolizing, and attempt to monopolize" referred to in paragraph 2 of the complaint and alleged "unlawful acts, transactions, practices and conduct" referred to in paragraph 13 of the complaint.

They also seek particulars as to charges made in paragraphs 16, as to the impairment of the development of industry; in paragraph 20, as to threats; in paragraph 21, as to specific rates, the location of spur tracks and loading sheds, etc.; and in paragraph 23, as to the position of the Western Association of Railway Executives. Particulars are also sought on allegations made in 14 other paragraphs of the complaint.

Northwest Board Meeting

The Northwest Shippers Advisory Board will hold its twenty-second annual meeting at St. Paul, Minn., on January 25. Thomas Balmer, vice-president of the Great Northern, will be the principal speaker at a joint luncheon with the St. Paul Association of Commerce.

Justice Department Backs Georgia's Plea

Basis of state's Supreme Court complaint is "conspiracy" of railroads, it says

Entering into the proceedings as a "friend of the court," the United States—that is, the Department of Justice—has filed a brief in the Supreme Court on the rule to show cause why the complaint of the state of Georgia against various railroads should not be filed, and in this brief has emphasized the contention made by the state that the basic issue is one of conspiracy, in which the federal antitrust statutes are applicable, rather than one of the legality or reasonableness of rates, where the Interstate Commerce Act is applicable.

Scents a "Conspiracy"—Argument as to whether or not the Supreme Court should docket the complaint for consideration on its merits was scheduled for January 2. The views of the railroads named as parties to the "conspiracy" on the legal questions involved were reviewed in *Railway Age* of December 16, page 934. The state subsequently filed a brief setting forth the contention that the Interstate Commerce Commission does not have jurisdiction in the circumstances, as the railroads argue, because the complaint seeks relief from the "conspiracy" rather than from the rates themselves, leaving the state "helpless" without the Supreme Court's support. The Department of Justice then appeared as *amicus curiae* to develop the state's position further.

The railroad "conspiracy" is asserted in the complaint to have enabled them "collusively" to fix and maintain freight rates that have "injured" the state of Georgia. The so-called conspiracy is the "hierarchy" of "private rate-fixing bodies" making up the long-established rate-making machinery of the industry, the nature of which is set forth in the complaint. Such machinery, it is asserted, not only fixes the rates of individual roads operating in Georgia, but together with "other private machinery, established and dominated by the conspiracy," fixes interterritorial rates "to accomplish the purposes of the conspiracy."

Coerced by the Yankees—Moreover, the Department of Justice pointed out that the complaint further states, "the defendant railroads with lines wholly or principally in the southern part of the United States generally are dominated and coerced by the defendant railroads in the northern part of the United States and, as a consequence, even when the defendant railroads operating in the South so desire, they cannot initiate and publish joint through rates between Georgia and the North when the northern carriers by concerted action refuse to join in such rates."

Two questions are involved in the right of the state to file this complaint in the Supreme Court directly, as the Department of Justice viewed the situation. One is whether the issue is within the original jurisdiction of that court, and the other

is whether the Interstate Commerce Act "sanctions the conspiracy alleged or precludes the maintenance of suit for injunctive relief."

State Seen as People's Papa—The state has been "injured," according to the brief, both as owner and operator of institutions that are shippers and consignees of freight, as owner of a railroad, and as *parens patriae*—or, so to speak, "the representative of the public interest and of the welfare of the body politic as a whole."

Having developed its contention that Article III of the Constitution and various court decisions cited as precedents support the original jurisdiction of the Supreme Court under such circumstances, the Attorney General's brief then turned to the question of I. C. C. jurisdiction. "The Sherman Antitrust Act requires that railroad rates be noncollusive; the Interstate Commerce Act provides for a commission with power to rectify such rates, competitively made, as are unreasonable, discriminatory, or otherwise violative of the Interstate Commerce Act," he observed. The *Socony-Vacuum* and *Trans-Missouri Freight Association* decisions of the Supreme Court then were mentioned as determining the illegality of price-fixing agreements *per se* irrespective of the reasonableness of the prices fixed, and as establishing the applicability of this principle to the railroads.

"Conspiring" to Do No Wrong—"The legislative history of the Sherman Antitrust Act and subsequent acts of Congress support the view that conspiracies of carriers to fix rates are prohibited even though the rates are not beyond the limits of reasonable and non-discriminatory rates under the Interstate Commerce Act," the brief asserted, and it went on to say that nothing in the latter statute "sanctions or condones" rate-fixing combinations. "The fact that each carrier's rates must comply with the requirements of the act does not tend in the slightest degree to prove that such carriers may lawfully combine in order to agree upon the rates which each shall charge."

Moreover, this argument continued, the act "does not provide within itself the remedies for correction of all the evils in rate-making which might constitute a violation of the Sherman Act," hence, it asserted, the law against conspiracies and restraints of trade provides the only means of relief.

RRs Must Not Love One Another—In conclusion, the Attorney General said that "the commission cannot preserve private initiative in rate-making. . . . The allegations of the complaint disclose a combination which substitutes for the freedom of action which is indispensable to the development of low cost transportation in the public interest, the restrictions of group action." In short, what Georgia asks, he explained, is an injunction against "the rate-fixing combination and conspiracy among the carriers," so that tariffs may be "established under competitive conditions and free from the coercive or collusive influences of the unlawful combination and conspiracy in violation of the antitrust laws." That is, "the conspiracy is the cause of the injury inflicted upon the state and no relief can be had until that conspiracy is uprooted."

S. P. Traffic Climbs to New All-Time Peak

Southern Pacific's freight and passenger loads piled up new all-time traffic records in 1944, A. T. Mercier, president, reported in a year-end statement of the railroad's activities. The company's net ton-miles of freight in 1944 will be slightly greater than in 1943. This represents a new all-time high for the fifth year in a row, being nearly three times the load carried in 1939, the last year before defense production affected rail transportation. Passenger-miles for 1944, it was stated, will exceed last year's by more than 11 per cent, being five times those of 1940, a fairly normal year, and establishing a new all-time record for the third year in succession. Net income in the year just ending, however, will be approximately 35 per cent lower than that of 1943, and is expected to run about 53 per cent behind that of 1942, it was noted, due to higher wages, increased material costs and mounting tax payments.

Among the chief factors enabling the railways to carry the vastly increased wartime transport burden, Mr. Mercier listed:

1. Good teamwork within railroad's own organization, with its customers, with military and government agencies, and close co-operation among the railroads.

2. New technological improvements and the cumulative effect of efficiencies of recent years.

Man-power shortage of nearly 10,000 continues to be Southern Pacific's No. 1 problem, Mr. Mercier declared, pointing out that the company now has 16,477 former employees in the armed forces.

Extends Order on Substitute Rail for Truck Service

The Interstate Commerce Commission has extended for one year, from December 31 until December 31, 1945, the expiration date of its Emergency Order No. M-5, which permits motor carriers upon one day's notice to stipulate in their tariffs that rail service may be substituted for truck service. As noted in the *Railway Age* of May 13, 1944, page 906, the order was issued originally in response to "the urgent need in the present emergency to conserve the existing motor vehicle facilities for the transportation of property."

The authority which it grants is conditioned upon certification by the Office of Defense Transportation that the substitution in any particular territory "will not adversely affect the transportation of freight by railroad and will aid in conserving motor carrier transportation facilities."

Railroads' Portion of Total Traffic Has Increased

In his first report to the President and Congress as Director of War Mobilization and Reconversion, Justice Byrnes on January 1 pointed out that the railroads have borne the brunt of the increase in the total volume of freight moved by all forms of domestic transportation from some 600 billion ton-miles in 1940 to more than one trillion ton-miles in each of the last two years. The railroads handled about 70 per cent of the total freight volume in 1944—including rail, truck, pipeline, air, and inland waterway movements—as compared to 62 per cent of the 1940 total, he observed, and at the same time rail passenger traffic practically quadrupled.

After describing various emergency measures undertaken to meet this situation and after giving a statistical comparison of the 1944 performance to that of 1940, Justice Byrnes went on to say: "The defeat of Germany will result in an accelerated east-west flow of transcontinental traffic which will most likely require the retention of major transport controls. The provision of additional equipment will then depend on war production requirements.

"While post-war freight and passenger traffic may be expected to decline from current high levels, it should continue at a much higher level than prevailed before the war. This suggests a heavy post-war demand for trucks, buses, rail passenger and maintenance equipment to replace worn-out facilities and to improve service."

Car Ferry Service a Special Kind of Water Transport

With Chairman Patterson complaining that such a classification "involves a degree of exactitude which is not contemplated or warranted by law," the Interstate Commerce Commission has affirmed Division 4's previous findings that freight-car ferry service is a special kind of transportation not embraced within the term "transportation of commodities generally" by water. The ruling came in a report of the commission on reconsideration in No. W-587, Foss Launch & Tug Co. Applications.

In Division 4's original report, the applicant was granted a "grandfather-clause" certificate authorizing continuance of operations as a common carrier by water of commodities generally between all points in the state of Washington on Puget Sound and Grays Harbor, and as a general tower between all points along the Pacific coast. The case was reopened upon petition of the Puget Sound Navigation Company, which contended that Foss proposed to engage in freight-car ferry service on Puget Sound under joint rates to be established with railroads serving Seattle.

Division 4's report on reconsideration was adverse to Foss, containing as it did the finding that the car ferry service was something special for which the applicant was unable to establish "grandfather" rights. The commission then reopened the proceeding for oral argument out of which has come the present report. It is a 7 to 3 decision, Commissioner Aitchison joining in Chairman Patterson's dissenting expression, and the dissent of Commissioner Lee being noted. Commissioner Barnard did not participate.

In framing his complaint that the majority report went in for undue exactitude in its classification of water-carrier operations, Chairman Patterson had this to say: "Under the certificate here issued applicant may transport general commodities in any sort of package or vehicle except a freight car. If the lading of a freight

News Department continued on second left-hand page

car were in a limited number of containers, those containers could be transferred to applicant's vessels; or the body of a loaded box car could be lifted from the trucks by a crane and placed on the vessel; or a loaded motor vehicle could be run onto the vessel; and in any of those circumstances the water transportation would be authorized by this certificate, but the transportation of a loaded freight car on its own wheels is prohibited. The majority's classification of applicant's operations depends not merely upon whether the container in which the traffic is offered is on wheels, but whether it is on a particular kind of wheels."

Representation of Employees

The Order of Railway Conductors has supplanted the Brotherhood of Railroad Trainmen as the Railway Labor Act representative of Western Pacific road conductors, according to results of a recent election which has been certified by the National Mediation Board. The vote was 94 to 92. In another recent election, the O. of R. C. successfully met a B. of R. T. challenge and retained the right to represent Chicago & North Western dining car stewards.

Following an investigation and check of representation authorizations, N. M. B. has certified the Brotherhood of Railway Clerks as representative of the previously-unrepresented red caps employed by the St. Joseph Union Depot Company.

Domestic Truckers to Get 24.1% of New Trucks Asked For

Although the War Production Board has scheduled for 1945 production substantially more trucks for commercial use than were built in 1944, this program will provide less than one-fourth (24.1 per cent) of the 773,935 vehicles which the Office of Defense Transportation estimated would be needed to meet "essential war and civilian transportation requirements" during the year, the O. D. T. said in a statement commenting on the W. P. B. program (outlined in *Railway Age* of December 30, 1944, page 1008).

Emphasis was put on the growing needs of the armed forces for trucks, the O. D. T. pointed out, by the reduction made by the W. P. B. from the allocations for the first two quarters of the year which it previously had tentatively approved. The final authorization was said to be only four-fifths as large as the earlier allocations, made in the summer and fall of 1944. While the W. P. B. did authorize production of some light trucks in 1945, unlike preceding war years, the O. D. T. was allotted only 35,704 in this category, it explained, or only 11.9 per cent of its requirement estimate of 299,600. This slash will be felt particularly by farmers and dairy operators, it observed, and all users of light trucks were warned to exercise the utmost care in conservation and preventive maintenance of such vehicles.

The O. D. T. estimates of needs in the medium truck classification did not fare much better, it was indicated, since it was allotted only 31 per cent of its requirement estimate of 354,118. Against an estimated need of 97,092 light-heavy trucks, it was allowed 49,750, or 32.4 per cent, and of its estimate of 23,125 of the heavy-heavy type required, it was allowed 13,122, or 42.2 per cent. Production of these trucks was resumed late in 1943 and went on last year. The 1945 production schedule set by the W. P. B. in these categories was slightly below the rate of output in the last quarter of 1944, the O. D. T. observed.

Report on Official Territory Iron and Steel Rates

The Interstate Commerce Commission has received from Examiner J. P. McGrath a proposed report in I. & S. No. 5269 and eight related complaint proceedings which, among other pleadings, bring into issue the present carload rates on iron and steel articles from and to points within Official territory. The examiner recommends a general commission finding that such rates have not been shown to be unreasonable or otherwise unlawful.

Other recommended findings deal with various specific rate situations brought into issue in the several complaints, the examiner rejecting complainant contentions in some instances and recommending adjustments to meet them in others. Also he would find that the railroads had failed to justify the schedules suspended in the title case. Those schedules, proposing certain increases, were filed in purported compliance with Division 2's report of August 14, 1943, in No. 28786 which found that rates on iron and steel articles from Kokomo, Ind., and Indianapolis to Minnesota, Iowa, Wisconsin, and upper Michigan were unduly preferential to manufacturers and shippers from Chicago, Peoria, Ill., and St. Louis, Mo. No. 28786, reopened by the commission, is among the proceedings dealt with in the present proposed report; and the examiner recommends that Division 2's findings be modified insofar as they are not in conformity with what he now recommends.

Newton Advocates Coast-to-Coast Passenger Runs

C. E. Newton, president of the Chesapeake & Ohio, in a statement on December 29 advocated the establishment of through transcontinental passenger train service, without changing cars en route from coast to coast. He said:

"In post-war years the railroads are going to face a highly competitive situation. Their competition for passenger traffic will be not alone with other railroads, but with the bus and particularly the airplane. The airplane can best the rails in speed but only in that respect. If the railroads are far sighted and are willing to go all out to make a real competitive bid against the air lines for passenger traffic, we believe they can more than hold their own against the plane. With modern equipment and improved service, the railroads should be able to more than make up the difference in speed to the passenger, not only in dependability of service—but also in comfort and convenience of travel.

"In that connection we believe that there is a real demand for a through transcontinental passenger service. To my knowledge no such service exists today. Passengers traveling from coast to coast must change trains, and even stations, either at the Chicago or St. Louis gateways. It would obviously be a great convenience if the C. & O. from Washington and the Nickel Plate from New York could deliver their passengers, over connecting lines, directly from the same car at their West Coast destinations, without change en route, and vice-versa.

"We believe that the introduction of a through passenger service between the West and East coasts would have a special appeal to many transcontinental travelers, even as against the cross continent air-service, after the novelty of flying has worn off.

"Transcontinental passenger services have been proposed in the past but for a variety of reasons none has ever become established. The C. & O. Lines place high on their agenda of post-war aims the objective of cooperating in the establishment of transcontinental through passenger service in collaboration with Western lines. We do not believe that the obstacles to our collaboration in the establishment of such service are insuperable, and we refuse to believe that it is impracticable until we have diligently explored all possibilities. That we propose to do. We have already initiated our preliminary studies to this end."

Rock Island to Inaugurate "Twin Star Rocket"

The Chicago, Rock Island & Pacific will, on January 14, inaugurate a Diesel-electric-drawn streamlined train, to be known as the "Twin Star Rocket," between the Twin Cities and Houston, Texas. The train, the equipment for which has been procured through a re-assignment of cars in the pool comprising its fleet of Rockets, will cover the 1,370 mi. in 25¾ hr. southbound and 25½ hr. northbound. The Twin Star Rocket—named in honor of the North Star state, Minnesota, and the Lone Star state, Texas—will leave Minneapolis daily at 11:30 a.m. and St. Paul at 11:55 a.m. and will arrive in Kansas City at 8:45 p.m. and Houston at 1:15 p.m. the following day. Northbound, it will leave Houston at 4:45 p.m. and will arrive at Kansas City at 8:30 a.m., St. Paul at 5:45 p.m. and Minneapolis at 6:15 p. m.

O. D. T. Appointments

Effective January 1, L. L. Adams was appointed assistant director of the railway department of the Office of Defense Transportation, succeeding S. P. Kelly, O. D. T. director Johnson has announced. At the same time Vincent T. Corbett was named assistant director for passenger traffic in the railway department, succeeding Richard H. Clare, who has returned to his position as assistant general passenger agent of the Pennsylvania, with headquarters at Philadelphia, Pa.

Mr. Adams has been on leave of absence from the Chesapeake & Ohio since 1942. He became associate director of the O. D. T. division of rates last November, after having been chief of the War Production Board's division of transportation and storage, transportation branch. Mr. Kelly, who was on the freight traffic staff

of the St. Louis Southwestern before he joined the O. D. T. in 1942, has been appointed assistant traffic manager of the Cities Service Oil Company, with headquarters at Bartlesville, Okla. During his government service he was active in the organization of symbol train movements of oil and petroleum products to the Atlantic Coast.

Mr. Corbett is on six months' leave of absence from his position as assistant general passenger agent of the Chicago, Rock Island & Pacific, stationed at Chicago. He has been in the service of that carrier for 34 years, according to the O. D. T., following earlier experience with the Chicago, Burlington & Quincy, the Chicago Junction, and the Alton.

Twenty U. P. Dining Car Workers Fined $9,250

Fines totaling $9,250 were imposed by the Federal District Court at Los Angeles, Cal., upon 20 stewards, assistant stewards and waiters of the Union Pacific on December 26, after they pleaded no contest to charges that they conspired to commit theft in interstate commerce. Of these, 17 stewards and assistant stewards were fined $500 each and 3 waiters were fined $250 each. In addition varying jail sentences were imposed but all were suspended and the 20 defendants were placed on probation for 18 months on condition that they stay out of dining car employment for that period.

The pleas of others of the 135 defendants arrested for withholding receipts for food sold on the "Challengers" will be heard on January 2.

November Truck Traffic

Motor carriers reporting to American Trucking Associations, Inc., transported in November, 1944, 2,226,054 tons of freight, a decrease of 3.7 per cent below the revised total of 2,312,042 tons for the previous month and an increase of 0.2 per cent above the 2,222,246 tons reported for November, 1943. The A. T. A. index figure, based on the 1938-1940 average monthly tonnage of reporting carriers, was 188.45 for November, 1944, as compared with the previous month's 190.74.

The foregoing figures, according to the A. T. A. announcement, are based on reports from 287 carriers in 44 states. Truckers in the Eastern district reported for November, 1944, decreases of 4 per cent below the previous month and 0.2 per cent below November, 1943. In the Southern region there was a decline of 1.7 per cent from the previous month, and a decrease of 1.6 per cent under November, 1943. The Western district's November, 1944, total was down 4.1 per cent from the previous month, but up 1.9 per cent above November, 1943.

I. C. C. Prescribes Bill-of-Lading Rules for Forwarders

Regulations covering the issuance of bills of lading by freight forwarders have been prescribed by the Interstate Commerce Commission in a report by Commissioner Porter. The report is in No. 28990, Bills of Lading of Freight Forwarders, which the commission instituted by an order dated June 7, 1943.

The decision will require the forwarders to provide for the issuance of a through bill of lading to the shipper at the initial point of origin to cover transportation therefrom to ultimate destination (1) by the forwarder itself on its form bill of lading, or (2) by a motor common carrier on its form bill of lading with a notation thereon showing the name of the freight forwarder in whose service the shipment is moving.

In lieu of a through bill of lading, the motor carrier at initial point of origin may issue a receipt, provided such receipt contains a notation showing the name of the forwarder in whose service the shipment is moving. In those instances where a receipt is issued by a motor common carrier in lieu of a bill of lading, the forwarder, when it receives the shipment at the "on line" or consolidating station, must issue a through bill of lading on its form as of the date the shipment is received at initial point of origin.

Meanwhile, the commission also finds "that the present and proposed rules, regulations, and practices affecting the issuance of bills of lading or shipping receipts for forwarder traffic are unjust and unreasonable in violation of section 404(a) of the act and in contravention of section 413."

I. C. C. Service Orders

By Service Order No. 263, effective January 15 to March 1, unless otherwise directed, the Interstate Commerce Commission has established sliding scale demurrage charges on loaded and empty tank cars suitable for interchange, of any ownership, held for any purpose on any track. Such charges will become effective after expiration of 24 hrs. free time, not excluding Sundays or legal holidays, in the case of loaded cars actually placed or "constructively placed" (that is, held because of consignee's inability to receive actual placement for any reason) for unloading or any other purpose, and also on empty cars actually placed and held for loading or any other purpose. On empty cars "constructively placed" for loading or any other purpose, 48 hrs. free time is allowed. When cars "constructively placed" are actually placed, the free time allowance runs from the time constructively placed, subject to an allowance for the actual time required to move the car to the point of actual placement. The applicable demurrage charges are $5.50 for the first demurrage day, $11 for the second day, and $22 for each succeeding demurrage day.

Detention of cars subject to this order may not be included in or computed on any average agreement. The order applies to all cars carrying the following equipment register mechanical designation prefixes: TA, TAI, TL, TM, TMI, TP, and TPI.

The order provides that such charges will not apply against bad order tank cars, provided proper notice is given the carrier, both of the discovery and the correction of the condition, nor will they apply on empty tank cars not required by the owner, lessee, or person controlling them after notice of the availability of these cars has been telegraphed to the Office of Defense Transportation. This order's demurrage provisions will apply on tank cars held at the Mexican border, taking precedence over the requirements of Service Order No. 135 as to such cars. Other provisions of the order prohibit railroads from accepting diversion or reconsignment orders on loaded or empty tank cars, except from the O. D. T., and make its demurrage provisions generally applicable to tank cars held at or short of ports for loading of vessels instead of storage charges normally prevailing under tariffs.

The requirements of service order No. 271, banning the transportation of race horses or racing dogs, are noted elsewhere in this issue. The Commission also has issued Revised Service Order No. 107, applying to the movement of freight into Mexico. This order was effective January 1, and will expire September 1, unless otherwise directed. In effect, it again required the car service division of the Association of American Railroads to establish embargoes to equalize the interchange of United States-owned and Mexican-owned cars at border points, this requirement having been suspended indefinitely on February 26, 1944.

The revised order applies to all freight cars "except privately owned, leased or controlled refrigerator or tank cars" and directs the Car Service Division to restrict the number of cars allowed to enter Mexico in any monthly period to the number moving from Mexico into the United States in the previous monthly period. As noted in *Railway Age* of December 30, 1944, page 1004, a separate embargo on the movement of United States-owned tank cars into Mexico became effective January 3.

Through another supplement to Service Order No. 189, to become effective February 15, that order's limitation on certain out-of-line hauls in connection with transit arrangements on grain, feed, seeds, etc., has been further extended to cover other out-of-line hauls in connection with specified transit points in Illinois, Kansas, Georgia, Iowa, Nebraska, Wisconsin, Alabama, Louisiana, Mississippi, Tennessee, Missouri, Oklahoma, and South Carolina.

Proposed Report in Another of South's Uniform Rate Cases

Making their proposed report on the demand of southern interests for interterritorial rates on fresh meats and packing-house products from Southern territory to Official territory on a basis no higher, mile for mile, than the Official territory basis, Interstate Commerce Commission Examiners George J. Hall and W. H. Smith have rejected the parity idea but recommended some downward adjustment in the assailed rates. The title case is No. 29043, complainants in which include the public service commissions of Florida, Georgia, Kentucky, Mississippi, South Carolina, and Tennessee.

In dealing with the complainants' demand for parity, the examiners rejected contentions that such a position was supported by various previous commission decisions, particularly *State of Alabama v. New York Central R. Co.*, 235 I. C. C. 255, and *Livestock to and from the South,*

News Department continued on second left-hand page

253 I. C. C. 241. As the examiners read these and other pertinent prior decisions, they laid down no general rule on parity, but rather emphasized the necessity for determinations in accordance with the particular facts of each case. Nevertheless the examiners found that the existing disparities between the Official territory rates and the South-North rates are excessive in view of changed conditions of recent years in the South's livestock and meat packing industries.

"A rate adjustment, such as that here assailed, which encourages the slaughter in the North of livestock produced in the South to the detriment of the southern packing industries is not responsive to the terms of the Hoch-Smith Resolution," the proposed report said. It was noted that the resolution, as interpreted by the courts, "made no change in the substantative law concerning the reasonableness of rates," but it did require such rate changes as will result in "a natural and proper development of the country as a whole."

The rate basis recommended by the examiners is related to the rates on livestock. They said that while the commission has not heretofore prescribed rates thus related, it has "discussed the desirability of such a relation, and in every instance where there was direct competition between the movement of livestock and its dressed products, as here, it has consistently condemned unduly wide spreads in rates as between both classes of traffic."

The relation between Official territory livestock rates, on the one hand, and fresh meats and packing-house products rates, on the other, was taken as the examiners' standard. As a general average the Official territory rates on fresh meats were found to be about 150 per cent of the livestock basis, while for packing-house products the figure was put at 105 per cent.

Framing their recommended scale on the basis of like relationships between the South-North rates (which now reflect "substantially higher relations"), the examiners would prescribe on fresh meats an interterritorial mileage scale ranging from 18 cents per 100 lb. for 10 miles to $1.20 for 1,600 miles. The range on packing-house products would be from 13 cents to 84 cents. These compare with scales proposed by complainants ranging on fresh meats from 16 cents for 10 miles to $1.15 for 1,500 miles; and on packing-house products from 11 cents to 79 cents.

Collision on Great Salt Lake

Fifty persons were killed, including 7 employees and 28 service men, and 67 persons were injured when the second section of the "Pacific Limited" of the Southern Pacific ran into the rear of the first section at Bagley, Utah, 18 mi. west of Ogden at 5:20 a. m. on December 31. The accident occurred on a line which runs through marshes prior to passing onto the trestle which spans Great Salt Lake at this point. The line is double track with automatic block signal protection. The weather was clear.

The first train consisted of 18 cars, including 3 mail, 2 baggage, 2 Army hospital, 7 coaches, 1 diner, 1 tourist sleeper and 2 Pullman sleeping cars; and the second consisted of 20 mail and express cars. The impact forced one of the two Pullman cars on the rear of the first section to telescope a diner and practically demolish a coach. Eight cars of the first section were derailed, while several cars in the second section were thrown around. According to preliminary reports, the first section had stopped when a hot box delayed a preceding freight train and was just beginning to move.

The second section was moving in clear weather on tangent track at about 30 m.p.h. in restricted territory where vision was unobstructed. The fireman of this section called the engineer's attention to signals indicating "stop," the first one at a point 1½ mi. and the second, 1,800 ft. east of the accident. In addition, a member of the crew of an eastbound freight train planted flares on the westbound track to indicate that the first section had stopped. The engineer of the second train, who was killed, was 64 years old and had been in service since 1909. His record was good.

Berge, Questioned, Talks on Other Subjects

Correspondence continues between Wendell Berge, assistant attorney general of the United States and Donald D. Conn, executive vice-president of the Transportation Association of America, on the former's attack on the Association in a speech made at Kansas City, Mo., on August 7, 1944, with Mr. Berge "detouring" from Mr. Conn's inquiry as to the authority for Mr. Berge's statement that "the railroads have now come forward with a plan for fastening upon the nation a complete transportation monopoly under their domination."

In a letter to Mr. Conn on November 21, Mr. Berge said: "In your letter of November 13, 1944, you repeat the request made in your letter of September 18, 1944, inquiring as to the source of my statement at Kansas City on August 7, 1944, regarding your railroad-sponsored plan for 'integrated' transportation systems which shall be free to utilize all forms of transportation and engage in business as 'transportation companies.'

"Domination" for $5000—"As I pointed out in my letter of October 19, 1944, Senate Report No. 26, Part II, 77th Cong., 1st Sess., pp. 42 through 47, discusses your organization and discloses that the Association of American Railroads supplied $5,000 for preliminary expenses at the time your Association was organized; that the advantages of an ostensibly independent organization were quickly recognized by the railroads, and the policy of keeping the railroads in the background was carefully followed in order to avoid the appearance of railroad domination; and that major decisions made by your organization were first discussed with and approved by the Association of American Railroads.

"I see no useful purpose to be served by the continuance of discussion regarding the details of the manner in which the railroads' financial support of your organization is contributed or regarding the lack of diligence alleged by you on the part of the Senate Committee (1936-37) in examining the files of other companies.

"I note also your view that regulated transportation should be excluded from the anti-trust laws. I disagree absolutely with that opinion."

In reply to Mr. Berge, Mr. Conn wrote: "In response to my inquiry of September 18 you dodged the substance thereof by entering into a discussion of this Association's origin and financial support. Neither are germane to the question.

"Everyone concerned with the transportation problem knows that railroads are members of this Association—as well as shippers and investors. They also know that we consult all elements of our membership before resolving our attitude on major questions.

Quotes With Words Omitted—"Now comes yours of November 24 again detouring from my inquiry. The first paragraph thereof refers to this Association's proposal. But, like Vice-President Wallace, your description again omits the word 'competitive.' What do you think is gained by such deliberate misrepresentation? Our correspondence has developed that this Association does recommend competitive transportation systems which, as you say, 'shall be free to utilize all forms of transportation and engage in business as 'transportation companies.' This Association has consistently opposed monopoly of any kind in transportation. This Association has consistently opposed regional or national systems. Hence we are not talking about this Association's recommendation unless you would have your Kansas City charge stand as a flagrant misrepresentation thereof. What I am after and what I propose to have is a direct answer to my inquiry of September 18. What is your authority for your Kansas City charge?

"Specifically what railroad or railroads proposed such regional systems and the monopoly implication thereof? Where can we secure a copy of the plan?

"If no railroad or railroads have submitted such a proposition what other groups, if any, have advocated regional systems since the report of the National Transportation Committee in 1934?"

Cashen Foresees General Wage Movement in 1945

"The feeling is growing among our organizations that during the coming year there must be another general movement forward on the wage front, so that living standards of the nation's railroad employees may be protected from further decline," said T. C. Cashen, chairman of the Railway Labor Executives' Association, in his year-end statement reported in the December 30 issue of "Labor."

Mr. Cashen's statement was in general a review of the 1944 achievements of railroad employees. They have, he said, met "every test of the war effort." He did not mention the period of War Department operation which came at the beginning of last year as a result of the strike threat growing out of the wage controversy.

"By toiling long hours, often two shifts in a row," he said, "they (the railroad em-

ployees) kept the 'iron horse' rolling day in and day out, never failing to meet every demand of the armed forces. Thereby they confuted the Cassandras who direly predicted that the railroads would collapse under the strain. It is plain now that, whatever weak spots there may have been in the war effort, the railroad industry was not one of them."

Mr. Cashen's suggestion that 1945 may see another general wage-increase movement came in the course of what "Labor" called his comment on "the darker side" of the present situation. In that connection the R. L. E. A. chairman was reported to have stressed "the fact that rail workers' wages have not kept pace with the soaring cost of living." At the same time he was further reported to have "emphasized" that "the foremost goal of railroad labor—and all labor—for 1945 will be to win the war as quickly as possible. . . ."

Would Cut Some Coal Rates into Youngstown

Youngstown, Ohio, and nearby points in the Mahoning and Shenango valleys steel-producing district would obtain lower rates on all-rail coal from the Freeport and Pittsburgh districts and on ex-river coal from Conway, Pa., and Colona if the Interstate Commerce Commission should adopt the recommended findings of Examiner Howard Hosmer's proposed report in the No. 28825 proceeding. That is the investigation (Bituminous Coal to the Youngstown District) instituted by the commission on its own motion into the lawfulness of interstate railroad rates on bituminous coal to Youngstown, and seven other points in its immediate vicinity, from all points in Pennsylvania and Maryland, including ports of transshipment on the Ohio river, and West Virginia mining points in the Cumberland-Piedmont district and a part of the Fairmont district.

While there is no suggestion in the proposed report of any tie-up, the commission's order instituting the investigation came along after it had met President Roosevelt's request for a report on the proposed Lake Erie-Ohio river canal, which report included the I. C. C.'s comment on the Army engineers' finding that "if the railroads would permanently reduce rates by an average of 29 cents per ton prior to the construction of the waterway, the through project could not be justified." The I. C. C. report (see *Railway Age* of February 3, 1940, page 245) warned that "railroads weakened by the provision of facilities for their competitiors can not respond as fully as they should to the needs of the public for efficient and safe transportation."

It went on to note the substantial revenue losses which would be suffered by railroads if their rates in the territory involved were to be cut 29 cents a ton. Moreover, it pointed out that most of the rates, including practically all those on iron ore and coal, "have been reviewed by us . . . and prescribed or approved as reasonable, and as fairly related to other rates." Youngstown proponents of the canal were assured that if they or the railroads serving them felt that additional rate adjustments on coal would improve their competitive situation, the commission was prepared "to consider carefully any evidence they may wish to offer in an appropriate proceeding."

Examiner Hosmer would cut the Pittsburgh district-Youngstown all-rail rate from $1.44 per ton to $1.37; the Freeport district-Youngstown all-rail rate from $1.44 to $1.32; and the ex-river rates from Conway and Colona from 90 cents to 80 cents. He would make the latter rate apply also to Warren, Ohio, which now has an ex-river rate 10 cents above Youngstown's. "Both," he said, "belong to a common industrial district, and their parity of rates should be restored, since the additional distance involved in the service to Warren is slight."

The examiner would reject a request of one of the intervenors. Consolidation Coal Company, for a finding that the relations between the rates from northern West Virginia districts and those from Western Pennsylvania have not been shown to be in any way unlawful. Such a finding, he said, "would have no significance except as it would be interpreted as requiring that any reductions growing out of this case should include the West Virginia rates in order to preserve rate relations. There should be no such requirement in the commission's findings and order, and the matter should be left to respondents to determine."

Previously, Mr. Hosmer had indicated his view that individual coal rates in the territory involved may not be as precisely fitted into the general adjustment as has been thought in the past.

With this approach, the examiner proceeded to appraise the rates from the Pittsburgh and Freeport districts to Youngstown, finding them "among the highest in central territory, while the evidence bearing on the cost of the service supports a conclusion that they might well be among the lowest, leaving out of the comparison the extremely low rates which here and there have sprung from the most acute carrier competition." In searchng around for a proper Pittsburgh-Youngstown rate, Mr. Hosmer found a "fair standard" in the so-called 23922 scale, prescribed by Division 4 in *Coal Trade Assn. of Indiana v. Baltimore & O. R. Co.* 190 I. C. C. 743. That scale's rate for distances between 90 and 100 miles is $1.37 per ton. The "persuasive reason" for a lower rate from the Freeport district is the fact that most of the movement from there "is concentrated as to both origins and destinations." For his proposed ex-river rate of 80 cents a ton, the examiner found "a criterion" in the ex-river rate of 85 cents from Cincinnati, Ohio, to Hamilton and Middleton which resulted from Division 3's decision in *American Rolling Mill Co. v. Baltimore & O. R. Co.*, 173 I. C. C. 357.

Mementos to Women Passengers Mark Anniversary of "400"

The tenth anniversary trip of the Twin Cities "400" was commemorated by the Chicago & North Western on January 2, when women passengers boarding the "400" were given a yellow rose bearing the colors of the present yellow and green streamliner. When the train was inaugurated on January 2, 1935, it was powered by a steam locomotive on a schedule of 7 hr. for the 408 mi. but three years later it was re-equipped and powered by a Diesel electric locomotive and the time reduced to 6¼ hr. Since Pearl Harbor the schedule has been increased 15 min. at the request of the Office of Defense Transportation.

Freight Car Loading

Loadings of revenue freight for the week ended December 30 were not available at the time this issue went to press.

Loading of revenue freight for the week ended December 23 totaled 762,449 cars, and the summary for that week, as compiled by the Car Service Division, A. A. R., follows:

Revenue Freight Car Loading

For the Week Ended Saturday, December 30

District	1944	1943	1942
Eastern	147,322	126,545	114,749
Allegheny	164,235	141,841	126,995
Pocahontas	46,103	39,677	34,834
Southern	119,659	98,787	90,745
Northwestern	85,306	71,451	68,298
Central Western	127,126	101,035	96,936
Southwestern	72,698	61,700	58,914
Total Western Districts	285,130	234,186	224,148
Total All Roads	762,449	641,036	591,471
Commodities			
Grain and grain products	46,088	41,730	39,423
Live stock	15,343	11,354	11,419
Coal	157,227	136,817	121,330
Coke	13,720	13,430	13,688
Forest products	41,536	36,902	31,054
Ore	12,036	11,399	11,882
Merchandise l.c.l.	100,620	84,544	72,393
Miscellaneous	375,879	304,860	290,282
December 23	762,449	641,036	591,471
December 16	749,883	758,881	743,061
December 9	793,554	823,311	744,183
December 2	808,260	862,733	759,731
November 25	768,730	819,832	743,464
Cumulative Total, 52 Weeks	43,499,983	42,417,680	42,826,463

Vacation Dispute Goes to Mediation

The services of the National Mediation Board were invoked by the 14 non-operating unions when, after conferences at Chicago with carriers' conference committees, their demands for longer vacations were not settled. The Board fixed January 9 for mediation hearings at Chicago.

F. M. Renshaw Dies

Fred M. Renshaw, who retired a year ago as manager of the Traffic Department of the Buffalo Chamber of Commerce, died in Norwood, Ohio, on December 29. Mr. Renshaw was president of the National Industrial Traffic League in 1933-35 and more recently served as president of the Great Lakes Regional Advisory Board.

Meetings and Conventions

The following list gives names of secretaries, dates of next or regular meetings and places of meetings:

ALLIED RAILWAY SUPPLY ASSOCIATION.—J. F. Gettrust, P. O. Box 5522, Chicago 80, Ill.

AMERICAN ASSOCIATION OF GENERAL BAGGAGE AGENTS.—E. P. Soebbing, 1450 Railway Exchange Bldg., St. Louis, Mo.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—B. D. Branch, C. R. R. of N. J., 143 Liberty St., New York 6, N. Y.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—Miss Elise LaChance, Room 901, 431 S. Dearborn St., Chicago 5, Ill. Annual meeting May 8-10, 1945, Hotel Stevens, Chicago, Ill.

AMERICAN ASSOCIATION OF RAILWAY ADVERTISING AGENTS.—E. A. Abbott, Poole Bros., Inc., 85 W. Harrison St., Chicago, Ill.

News Department continued on second left-hand page

American Railway Bridge and Building Association.—Miss Elise LaChance, Room 901, 431 S. Dearborn St., Chicago 5, Ill. Annual meeting, October 16-18, 1945, Hotel Stevens, Chicago, Ill.

American Railway Car Institute.—W. C. Tabbert, 19 Rector St., New York 6, N. Y.

American Railway Development Association. O. K. Quivey, B. & O. R. R., Baltimore 1, Md.

American Railway Engineering Association.—Works in cooperation with the Association of American Railroads, Engineering Division.—W. S. Lacher, 59 E. Van Buren St., Chicago 5, Ill. Annual meeting, March 13-15, 1945, Palmer House, Chicago, Ill.

American Railway Magazine Editors' Association.—Virginia Tanner, Baltimore & Ohio Magazine, Room 1202, B. & O. Bldg., Baltimore 1, Md.

American Short Line Railroad Association.—J. P. Nye, Tower Bldg., Washington 5, D. C.

American Society of Mechanical Engineers.—C. E. Davies, 29 W. 39th St., New York 18, N. Y.

Railroad Division.—E. L. Woodward, Railway Mechanical Engineer, 105 W. Adams St., Chicago 3, Ill.

American Transit Association.—Guy C. Hecker, 292 Madison Ave., New York 17, N. Y.

American Wood-Preservers' Association.—H. L. Dawson, 1427 Eye St., N. W., Washington 5, D. C.

Associated Traffic Clubs of America, Inc.—R. A. Ellison, Cincinnati Chamber of Commerce, 1203 C. of C. Bldg., Cincinnati 2, O.

Association of American Railroad Dining Car Officers.—F. R. Borger, C. I. & L. Ry., 836 S. Federal St., Chicago 5, Ill.

Association of American Railroads.—H. J. Forster, Transportation Bldg., Washington 6, D. C.

Operations and Maintenance Department.—Charles H. Buford, Vice-President, Transportation Bldg., Washington 6, D.C.

Operating-Transportation Division. — L. R. Knott, 59 E. Van Buren St., Chicago 5, Ill.

Operating Section.—J. C. Caviston, 30 Vesey St., New York 7, N. Y.

Transportation Section.—H. A. Eaton, 59 E. Van Buren St., Chicago 5, Ill.

Communications Section.—W. A. Fairbanks, 30 Vesey St., New York 7, N. Y.

Fire Protection and Insurance Section. —W. F. Steffens, New York Central, Room 3317, 230 Park Avenue, New York 17, N. Y.

Freight Station Section.—N. Kaplan, 59 E. Van Buren St., Chicago 5, Ill.

Medical and Surgical Section.—J. C. Caviston, 30 Vesey St., New York 7, N. Y.

Protective Section.—J. C. Caviston, 30 Vesey St., New York 7, N. Y.

Safety Section.—J. C. Caviston, 30 Vesey St., New York 7, N. Y.

Engineering Division.—W. S. Lacher, 59 E. Van Buren St., Chicago 5, Ill. Annual meeting, March 13-15, 1945, Palmer House, Chicago, Ill.

Construction and Maintenance Section. —W. S. Lacher, 59 E. Van Buren St., Chicago 5, Ill. Annual meeting, March 13-15, 1945, Palmer House, Chicago, Ill.

Electrical Section.—W. S. Lacher, 59 E. Van Buren St., Chicago 5, Ill.

Signal Section.—R. H. C. Balliet, 30 Vesey St., New York 7, N. Y.

Mechanical Division.—Arthur C. Browning, 59 E. Van Buren St., Chicago 5, Ill.

Electrical Section.—J. A. Andreucetti, 59 E. Van Buren St., Chicago 5, Ill.

Purchases and Stores Division.—W. J. Farrell (Executive Vice-Chairman), Transportation Bldg., Washington 6, D. C.

Freight Claim Division.—Lewis Pilcher, 59 E. Van Buren St., Chicago 5, Ill. Annual meeting, May, 1945.

Motor Transport Division.—George M. Campbell, Transportation Bldg., Washington 6, D. C.

Car Service Division.—E. W. Coughlin, (Assistant to Chairman), Transportation Bldg., Washington 6, D. C.

Finance, Accounting, Taxation and Valuation Department.—E. H. Bunnell, Vice-President, Transportation Bldg., Washington 6, D. C.

Accounting Division.—E. R. Ford, Transportation Bldg., Washington 6, D. C.

Treasury Division.—E. R. Ford, Transportation Bldg., Washington 6, D. C.

Traffic Department.—A. F. Cleveland, Vice-President, Transportation Bldg., Washington 6, D. C.

Association of Railway Claim Agents.—F. L. Johnson, Alton R. R., 340 W. Harrison St., Chicago 7, Ill.

Bridge and Building Supply Men's Association.—P. R. Austin, Johns-Manville Sales Corp., Merchandise Mart, Chicago, Ill.

Canadian Railway Club.—C. R. Crook, 4415 Marcil Ave., N. D. G., Montreal, Que. Regular meetings second Monday of each month, except June, July and August, Mount Royal Hotel, Montreal, Que.

Car Department Association of St. Louis, Mo. —J. J. Sheehan, 1101 Missouri Pacific Bldg., St. Louis, Mo. Regular meetings, third Tuesday of each month, except June, July and August, Hotel De Soto, St. Louis, Mo.

Car Department Officers' Association.—F. H. Stremmel, 6536 Oxford Ave., Chicago 31, Ill.

Car Foremen's Assocation of Chicago.—Ralph J. Feddor, 2803 N. Campbell Ave., Chicago, Ill. Regular meetings, second Monday of each month, except June, July and August, La Salle Hotel, Chicago, Ill.

Central Railway Club of Buffalo.—R. E. Mann, 1840-42 Hotel Statler, McKinley Square, Buffalo, N. Y. Regular meetings, second Thursday of each month, except June, July and August, Hotel Statler, Buffalo, N. Y.

Eastern Association of Car Service Officers. —H. J. Hawthorne, Union Railroad, East Pittsburgh, Pa.

Eastern Car Foreman's Association.—W. P. Dizard, 30 Church St., New York 7, N. Y. Regular meetings, second Friday of January, February (Annual Dinner), March, April, May, October and November, 29 W. 39th St., New York, N. Y.

Locomotive Maintenance Officers' Association.—C. M. Lipscomb, 1721 Parker Street, North Little Rock, Ark.

Master Boiler Makers' Association.—A. F. Stiglmeier, 29 Parkwood St., Albany 3, N. Y.

National Association of Railroad and Utilities Commissioners.—Ben Smart, 7413 New Post Office Bldg., Washington, D. C.

National Association of Shippers' Advisory Boards.—W. B. Shepherd, Aluminum Company of America, Gulf Bldg., Pittsburgh, Pa.

National Industrial Traffic League.—Edward F. Lacey, Suite 450, Munsey Bldg., Washington 4, D. C. Annual meeting, November 29-30, 1945, Palmer House, Chicago, Ill.

National Railway Appliances Association.—C. H. White, Room 1826, 208 S. La Salle St., Chicago 4, Ill.

New England Railroad Club.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meetings, second Tuesday of each month, except June, July, August and September, Hotel Vendome, Boston, Mass.

New York Railroad Club. — D. W. Pye, 30 Church St., New York 7, N. Y. Regular meetings, third Thursday of each month, except June, July, August, September and December, 29 W. 39th St., New York, N. Y.

Northwest Carmen's Association. — E. N. Myers, Minnesota Transfer Ry., 1434 Iowa Ave., St. Paul, Minn. Regular meetings, first Monday of each month, except June, July and August, Midway Club, 1931 University Ave., St. Paul, Minn.

Pacific Railway Club.—William S. Wollner, P. O. Box A, Sausalito, Cal. Regular meetings, second Thursday of each alternate month, at Palace Hotel, San Francisco, Cal., and Hotel Biltmore, Los Angeles, Cal.

Railway Business Association.—P. H. Middleton, First National Bank Bldg., Chicago 3, Ill.

Railway Club of Pittsburgh.—J. D. Conway, 308 Keenan Bldg., Pittsburgh, Pa. Regular meetings, fourth Thursday of each month, except June, July and August, Fort Pitt Hotel, Pittsburgh, Pa.

Railway Electric Supply Manufacturers' Association.—J. McC. Price, Allen-Bradley Company, 624 W. Adams St., Chicago 6, Ill.

Railway Fuel and Traveling Engineers' Association.—T. Duff Smith, Room 811, Utilities Bldg., 327 S. La Salle St., Chicago 4, Ill.

Railway Supply Manufacturers' Association. —J. D. Conway, 308 Keenan Bldg., Pittsburgh, Pa.

Railway Telegraph and Telephone Appliance Association.—G. A. Nelson, Waterbury Battery Company, 30 Church St., New York 7, N. Y. Meets with Communications Section of A. A. R.

Railway Tie Association.—Roy M. Edmonds, 610 Shell Bldg., St. Louis 3, Mo. Annual meeting, May 8-9, 1945, Netherland Plaza Hotel, Cincinnati, O.

Roadmasters' and Maintenance of Way Association.—Miss Elise LaChance, Room 901, 431 S. Dearborn St., Chicago 5, Ill. Annual meeting, September 18-20, 1945, Hotel Stevens, Chicago, Ill.

Signal Appliance Association.—G. A. Nelson, Waterbury Battery Company, 30 Church St., New York 7, N. Y. Meets with A. A. R. Signal Section.

Southern and Southwestern Railway Club.—A. T. Miller, 4 Hunter St., S. E., Atlanta, Ga. Regular meetings, third Thursday in January, March, May, July, September and November, Ansley Hotel, Atlanta, Ga.

Southern Association of Car Service Officers. —D. W. Brantley, C. of Ga., Savannah, Ga.

Toronto Railway Club.—D. M. George, P. O. Box 8, Terminal "A," Toronto 2, Ont. Regular meetings, fourth Monday of each month, except June, July and August, Royal York Hotel, Toronto, Ont.

Track Supply Association.—Lewis Thomas, Q. and C. Company, 59 E. Van Buren St., Chicago 5, Ill.

United Associations of Railroad Veterans.—Roy E. Collins, 112 Hatfield Place, Port Richmond, Staten Island 2, N. Y.

Western Railway Club.—E. E. Thulin, Suite 339, Hotel Sherman, Chicago, Ill. Regular meetings, third Monday of each month, except January, June, July, August and September, Hotel Sherman, Chicago, Ill.

Supply Trade

The **Warren McArthur Corporation,** Bantam, Conn., was presented the Army-Navy "E" award for excellence in war production on December 28.

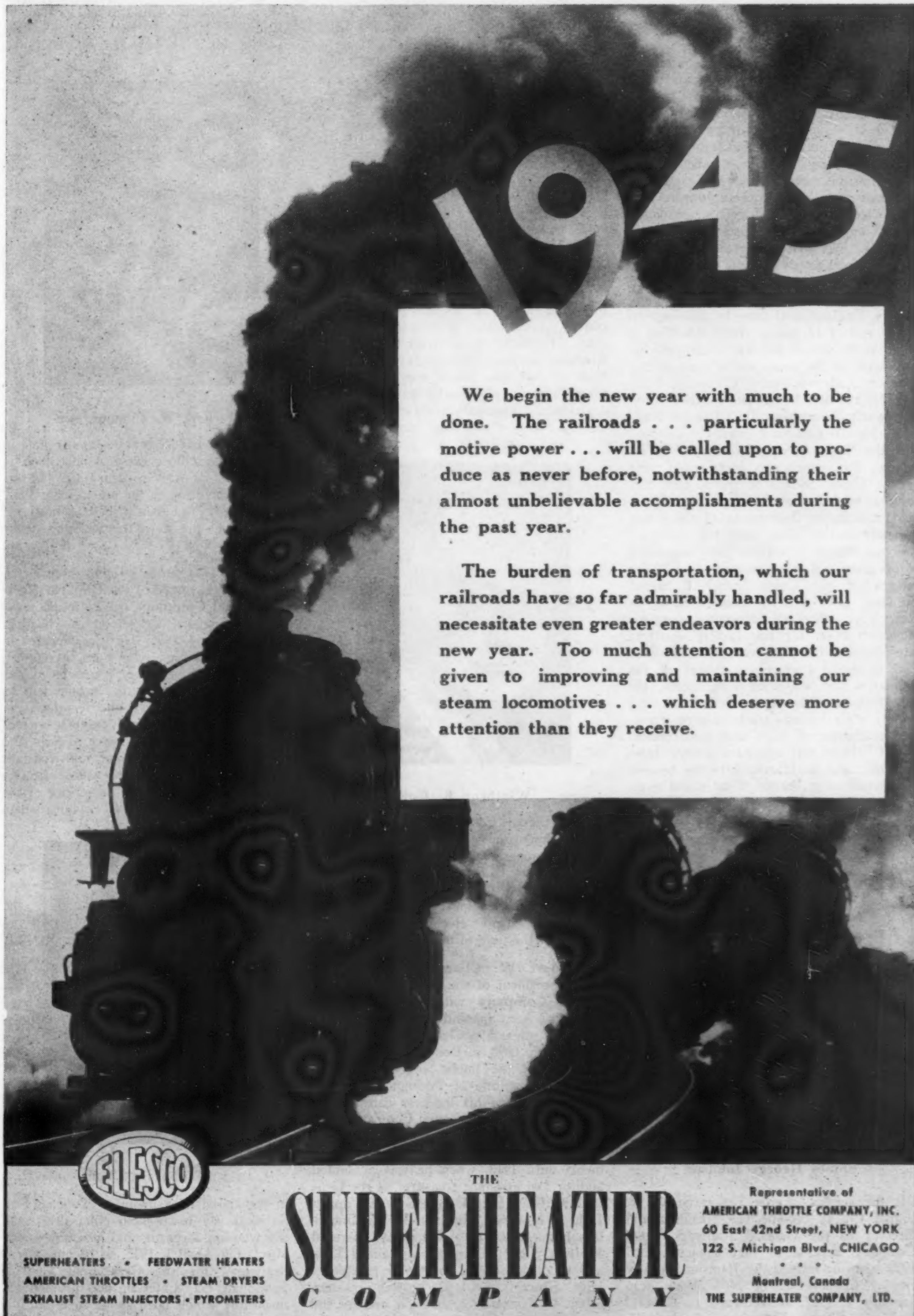
The **Aircraft Accessories Corporation,** Kansas City, Kan., has changed its name to the **Aireon Manufacturing Corporation.** The name "Aireon" is intended to convey the thought that the products being manufactured are partly in the mechanical field as applied to aircraft and partly in the use of electronics as applied to various fields including train communication on railroads.

Supplementing and replacing its preliminary report of March 6, 1944, (reported in *Railway Age* of March 11, page 520), the **Baldwin Locomotive Works** in its final report for the year 1943 lists sales of $221,549,903, as compared with $167,259,141 in 1942 and net profit for the year of $4,840,157, as compared with $5,316,344. The annual report was delayed pending renegotiation of the company's war contracts.

The **Inland Steel Company,** Chicago, on January 1, established a metallurgical and inspection department by merging the activities of its Indiana Harbor works metallurgical department, its Indiana Harbor works inspection department and its general office department of inspection and metallurgy. The purpose of the consolidation is to effect a unified control over all of the metallurgical and inspection services of the company and to obtain more complete correlation of these activities. **J. Hunter Nead,** chief metallurgist, has been promoted to manager of the new department with headquarters at Indiana Harbor, Ind., while **E. D. Martin** and **T. S. Washburn** have been appointed assistant managers at the Indiana Harbor works and the general office in Chicago, respectively. **L. S. Marsh,** manager of the general office department inspection and metallurgy, will continue in a special metallurgical advisory and consulting capacity.

Sidney George Johnson, vice-president in charge of sales of the **General Railway Signal Company,** with headquarters in New York, has retired at his own request from active charge of sales. Mr. Johnson continues in an advisory capacity and as a director of the company. His father, Henry Johnson, his two brothers, Arthur H. and Edward Charles, and a cousin, Charles Roberts Johnson, were all pioneers in railway signaling, having devoted their lives to the design, engineering and development of systems and apparatus in this field. Henry Johnson was associated for many years in the signaling field in England with both Stevens & Sons and Saxby & Farmer, Ltd., of London, man-

News Department continued on next left-hand page


1945
We begin the new year with much to be done. The railroads . . . particularly the motive power . . . will be called upon to produce as never before, notwithstanding their almost unbelievable accomplishments during the past year.
The burden of transportation, which our railroads have so far admirably handled, will necessitate even greater endeavors during the new year. Too much attention cannot be given to improving and maintaining our steam locomotives . . . which deserve more attention than they receive.
ELESCO
SUPERHEATERS • FEEDWATER HEATERS
AMERICAN THROTTLES • STEAM DRYERS
EXHAUST STEAM INJECTORS • PYROMETERS
THE
SUPERHEATER
COMPANY
Representative of
AMERICAN THROTTLE COMPANY, INC.
60 East 42nd Street, NEW YORK
122 S. Michigan Blvd., CHICAGO
Montreal, Canada
THE SUPERHEATER COMPANY, LTD.

ufacturers of signaling apparatus. **Henry** Johnson's nephew, Charles Roberts Johnson, received his early training under Henry Johnson with Saxby & Farmer, Ltd., and was first sent to India and then recalled by his uncle and sent to the United States on an important signaling assignment to design protection for a grade crossing for the Pennsylvania and the Central Railroad of New Jersey in Elizabeth, N. J. Following the completion of this engineering project, Charles Roberts Johnson became vice-president and general manager of the Union Switch & Signal Co. at Swissvale, Pa., and shortly thereafter sent for Mr. Johnson's father to come to the United States to be works manager. Sidney George Johnson was born in 1874, in Eccles, Lancashire, England, and came to this country at the age of 12 years. After attending a preparatory school he was employed for two years in the construction crew of the Johnson Railroad Signal Company, Rahway, N. J., where he had previously worked during school vacations. The Johnson Railroad Signal Company was consolidated with the National Switch & Signal Co. of Easton, Pa., which was soon taken over by the Union Switch & Signal Co. Mr. Johnson was associated for one year in the field installation department of the latter company and in 1896, when the Standard Railway Signal Company was organized he became its signal engineer. In 1899 he returned to the Union Switch & Signal Co. and, after a brief assignment in its New York office was appointed engineer of construction for the eastern district; later he was for two years at Swissvale, Pa., as signal engineer in charge of the estimating and cataloging departments. He was then transferred to New York and shortly after he was made eastern manager in charge of sales and construction. About 1910 he was appointed general sales manager, and in March, 1914, he became vice-president in charge of sales and engineering. The following July Mr. Johnson

Sidney George Johnson

left the service of the Union Switch & Signal Co. to become vice-president and director of the General Railway Signal Company, serving in that capacity until 1920 when he formed the Johnson Railway Supply Corporation of New York. On January 1, 1927, he returned to General Railway Signal Company, serving as special representative until November of that year when he was appointed assistant to the president. On February 8, 1936, he was elected vice-president in charge of sales, which position he held until his recent retirement.

Winthrop K. Howe, vice-president in charge of engineering of the **General Railway Signal Company,** with offices at Rochester, N. Y., has retired, after 44 years of service with the company, but will continue in an advisory capacity. He was born in Clifton, Ill., December 26, 1868, and was educated at the Chicago Manual Training School, 1883 to 1886, and Purdue University, graduating in mechanical engineering from the latter institution in 1889, following which he took a post-graduate course in electrical engineering for one year. He started work with the Western Electric Company, Chicago, in 1890. From 1900 to 1905 Mr. Howe was successively foreman of the electrical department, chief draftsman, principal assistant engineer, factory manager and chief engineer of the

Winthrop K. Howe

Taylor Signal Company, Buffalo, N. Y. This company merged with the Pneumatic Signal Company of Rochester, N. Y., on June 13, 1904, to form the present General Railway Signal Company. Mr. Howe was appointed chief engineer of the new company and was later elected to the position he held at the time of his retirement.

Herbert W. Chamberlain, assistant to the president of the **General Railway Signal Company** with offices in New York, has been appointed vice-president in charge of sales. Mr. Chamberlain was born January 25, 1890, in Rochester, N. Y., and educated in the public schools and the Rochester Institute of Technology of that city. He started his business career with the General Railway Signal Company upon its organization in 1904, and served in the factory, production and financial departments until 1913, when he was appointed auditor and assistant treasurer of the General Railway Signal Company of Canada Ltd., at Montreal. In 1918 Mr. Chamberlain became vice-president of the General Railway Signal Company of Canada Ltd., and succeeded to its presidency two years later. From 1922 to 1924 he was president of the Cyclemoter Corporation, and for the next three years vice-president of the G-R-S Products Corporation located at Albany, N. Y. In 1927 Mr. Chamberlain was appointed assistant treasurer of the

Herbert W. Chamberlain

General Railway Signal Company and in 1933 was elected secretary, which office he has retained up to the present time. He was appointed assistant to the president in 1937, which position he has also held until his recent appointment to the vice-presidency of the company.

Wilbur D. Cloud, resident manager of the New York office of the **General Railway Signal Company,** has been appointed eastern manager. Mr. Cloud was born in Iowa on July 4, 1896. He was educated in the public and high schools at Davenport, Iowa, and received his first railroad experience in the engineering department as rodman on preliminary and location surveys, serving in all capacities up to instrumentman in Iowa, Tennessee, Texas and Louisiana, and as draftsman and assistant engineer on railway maintenance. In December, 1909, he entered the service of the Atchison, Topeka & Santa Fe as draftsman

Wilbur D. Cloud

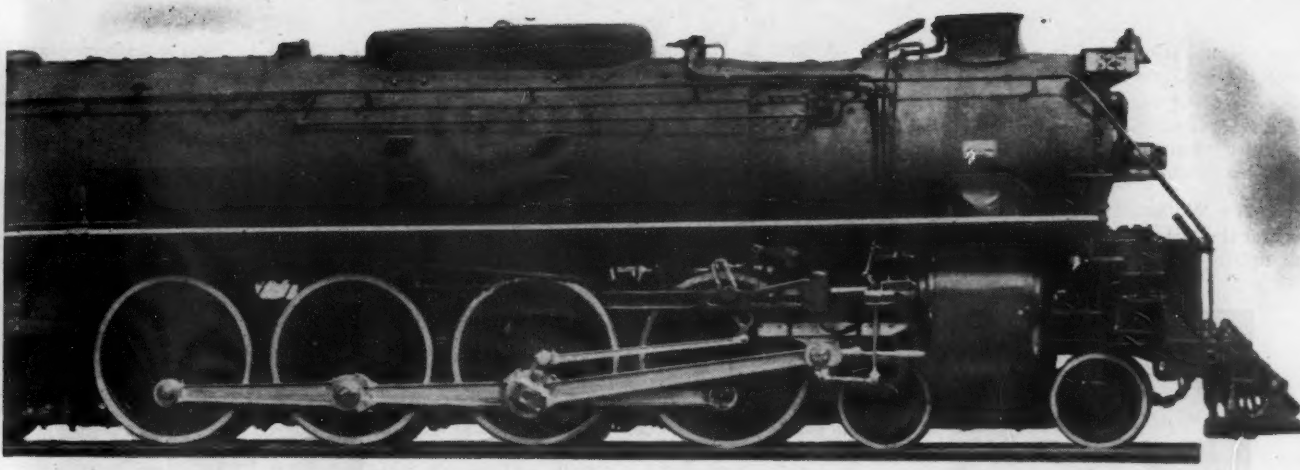
in the signal department at Topeka, Kan. Subsequently he became chief draftsman, construction foreman, and assistant supervisor. On April 1, 1915, he became circuit draftsman for the Central of Georgia, Savannah, Ga. Later he was promoted to inspector, which position he held until he became sales engineer for the General Rail-

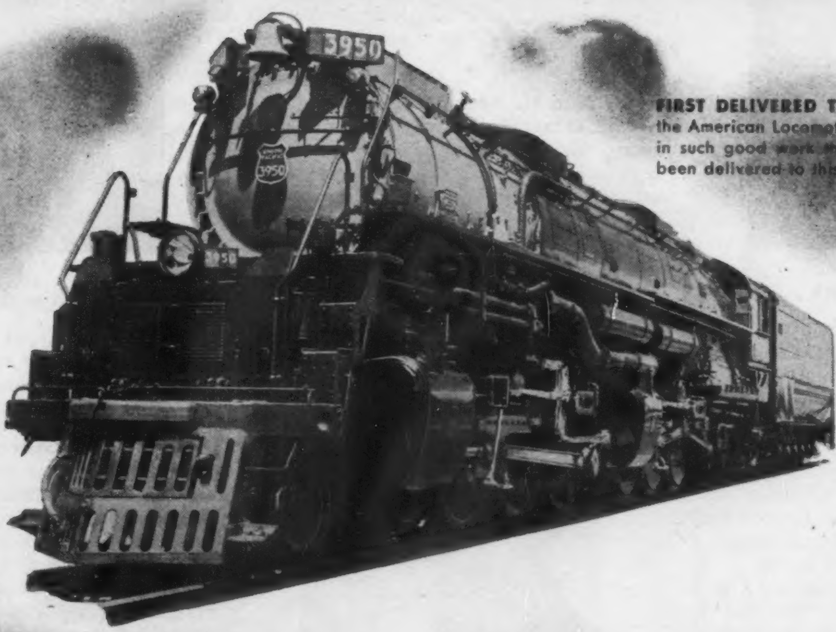
News Department continued on second left-hand page


X4014
4014
4014
Bingham

ANOTHER ENGINE MAKING GOOD on the Union Pacific is the 4-8-4 type steam locomotive built by American Locomotive in 1937. The 20 that were first installed that year proved so successful that an additional order for 15 more was delivered to the U.P. in 1939, followed by 10 more in 1944.

Each is unsurpassed for the job





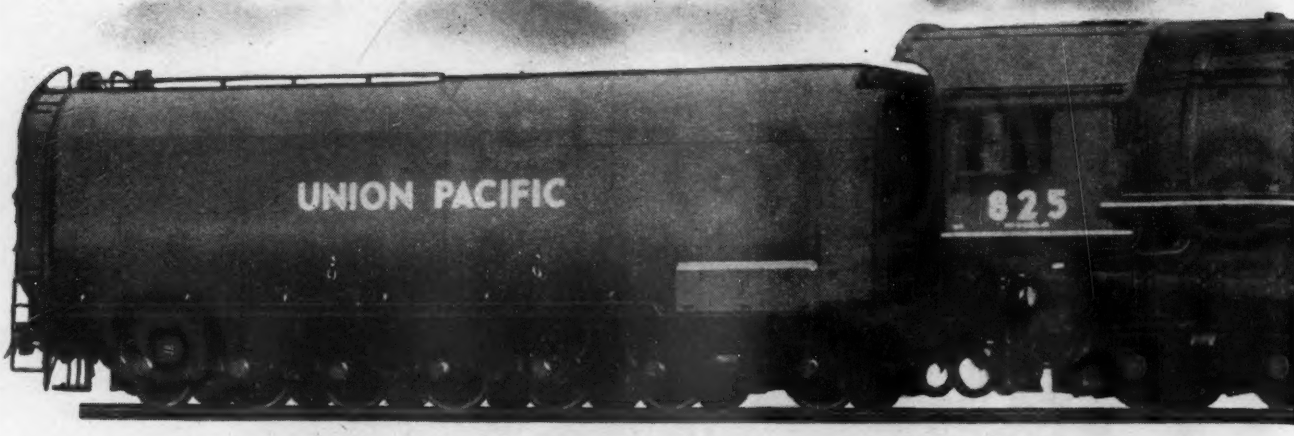
FIRST DELIVERED TO THE U. P. in 1936, the American Locomotive-built 4-6-6-4 turned in such good work that a total of 99 have been delivered to this road to date.

because each was built for the job!

"BIG BOY", the world's largest and most powerful steam engine, was built by American Locomotive for the Union Pacific. It is designed to haul maximum tonnage and maintain schedules without helper service on a ruling grade of 1.14% over the Wasatch Mountains. "Big Boy" produces maximum power output continuously at 70 m.p.h., has a top speed of 80 m.p.h.

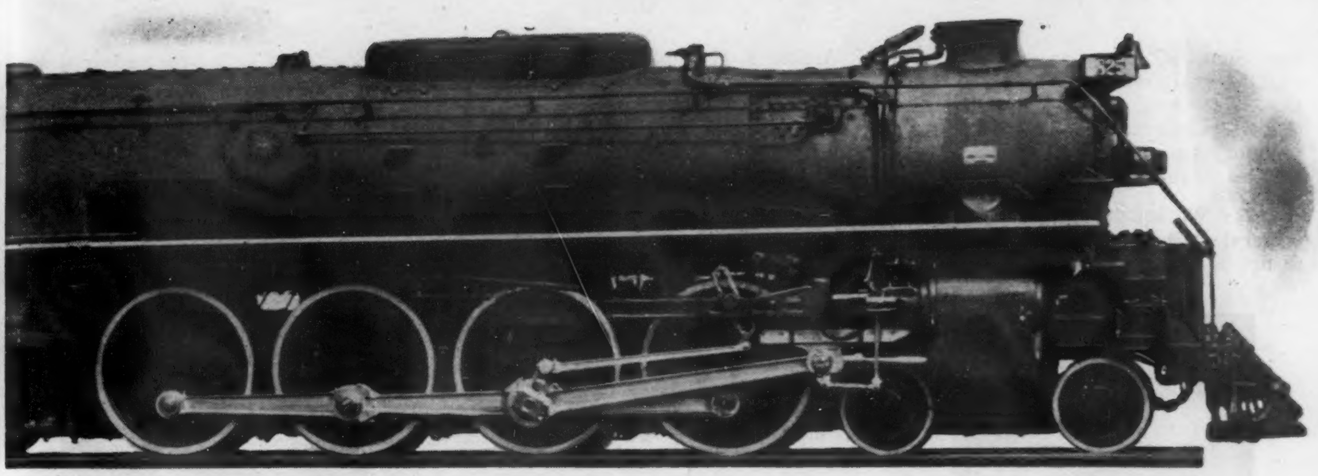
American Locomotive

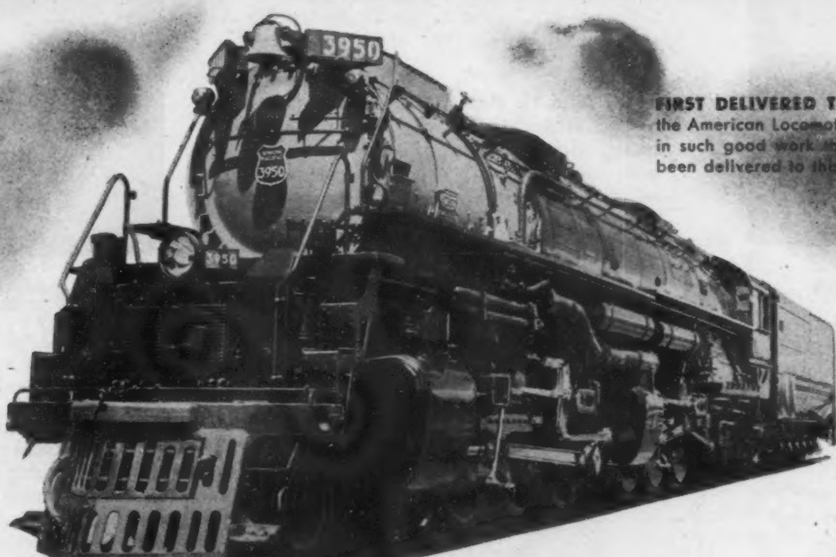
NEW YORK



ANOTHER ENGINE MAKING GOOD on the Union Pacific is the 4-8-4 type steam locomotive built by American Locomotive in 1937. The 20 that were first installed that year proved so successful that an additional order for 15 more was delivered to the U.P. in 1939, followed by 10 more in 1944.

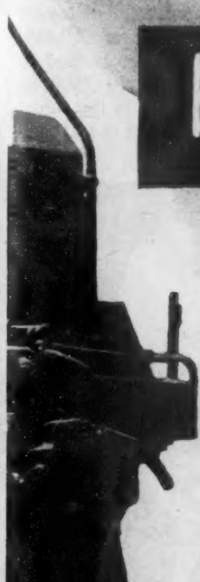
Each is unsurpassed for the job





FIRST DELIVERED TO THE U. P. in 1936, the American Locomotive-built 4-6-6-4 turned in such good work that a total of 99 have been delivered to the road to date.

because each was built for the job!



"BIG BOY", the world's largest and most powerful steam engine, was built by American Locomotive for the Union Pacific. It is designed to haul maximum tonnage and maintain schedules without helper service on a ruling grade of 1.14% over the Wasatch Mountains. "Big Boy" produces maximum power output continuously at 70 m.p.h., has a top speed of 80 m.p.h.

American Locomotive

NEW YORK

way Signal Company in August, 1920, with headquarters at New York. In April, 1936, Mr. Cloud was appointed assistant resident manager, and in January, 1937, resident manager, which position he held until his recent appointment.

Percy W. Smith, sales engineer of the **General Railway Signal Company,** reporting to the New York office, has been

Percy W. Smith

appointed resident manager of the New York office, succeeding **W. D. Cloud.** Mr. Smith was born at Springville, N. Y., on February 2, 1900. He was educated in the grade and high schools at Salamanca, N. Y. Later he studied at the Rochester Institute of Technology, Rochester, N. Y. During school vacations he worked as foreman for the Westinghouse-Church-Kerr Co., and also for the Buffalo, Rochester & Pittsburgh (now Baltimore & Ohio). In 1921 he became draftsman for the American Locomotive Company. In 1922 he entered the service of the B. R. & P. as draftsman in the mechanical engineer's office, which position he held until 1923, when he resigned to become a draftsman and later an engineer in the engineering department of the General Railway Signal Company. In September, 1937, Mr. Smith

Arthur S. Heimbach

was appointed sales engineer for the General Railway Signal Company in New York, which position he retained until his recent promotion.

Arthur S. Heimbach, sales engineer in the Chicago office of the **General Railway Signal Company,** has been appointed resident manager of the Chicago office. Mr. Heimbach was born December 23, 1902, in Allentown, Pa. After graduating in electrical engineering from Pennsylvania State College in 1924 he completed the two-year apprenticeship course of the Union Switch & Signal Company. He served as engineer for this company until October, 1927, when he became train control supervisor of the Pittsburgh & Lake Erie. In July, 1931, Mr. Heimbach was appointed assistant signal engineer, and in May, 1933, he became assistant signal and telegraph engineer, being promoted to principal assistant engineer in July, 1937. In July, 1941, he became associated with the General Railway Signal Company in Chicago as sales engineer, the position which he held until his recent appointment.

William H. Bennett, resident engineer of the **General Railway Signal Company,** with offices in San Francisco, has been appointed sales engineer with headquarters in New York. Mr. Bennett was educated at the Warwick, N. Y., high school. In September, 1920, he entered the employ of the Federal Signal Company. In

William H. Bennett

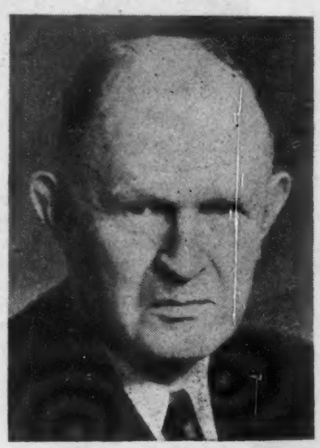
1921 he entered the employ of the Lehigh & Hudson River, in the telephone and telegraph department. In July, 1922, Mr. Bennett became associated with the General Railway Signal Company, and in May, 1939, was made resident engineer, with headquarters in San Francisco, retaining this position until his recent appointment as sales engineer at New York.

Oscar S. Field, senior designing engineer for the **General Railway Signal Company,** with offices at Rochester, N. Y., has been appointed director of engineering and research. Mr. Field was born March 9, 1892, in London, England. He received his early education in London at the St. Clement Danes Holborn Estate School, graduating in July, 1907, and graduated in civil engineering from Regents Polytechnic on London in June, 1912. In the same year he came to the United States and entered the employ of the Brown Construction Company and later the Baldwin Locomotive Company, both of Philadelphia, Pa., as assistant designer in both companies. In November, 1914, he became connected with the Hall Signal Company at Garwood, N. J., as assistant to consulting engineer, and in May, 1916, was promoted to patent attorney, becoming chief engineer in 1919. Mr. Field became chief engineer of the G-R-S Products Company at Albany, N. Y., in November, 1925. In April, 1928, he became senior designing engineer of the General Railway Signal Company at

Oscar S. Field

Rochester, N. Y., which position he has held until his recent appointment as director of engineering and research.

Charles S. Bushnell, train control engineer of the **General Railway Signal Company,** has been promoted to chief engineer, effective January 1, 1945. Mr. Bushnell was born in Philadelphia, Pa., and was graduated from Haverford College, Pa., in general engineering in 1905. After a year in the mechanical branch of the steel business, he became a rodman in the maintenance department of the Pennsylvania. In 1908 Mr. Bushnell entered the employ of the Federal Signal Company at Albany, N. Y., as draftsman, and later worked in the construction department. In 1909 he became a construction foreman in the signal department of the New York Central, and



Charles S. Bushnell

later signal inspector. Mr. Bushnell entered the employ of the General Railway Signal Company in 1911 as wireman. He spent two years on this work which was

News Department continued on fifth right-hand page

with
vood,
neer,
atent
1919.
the
pany,
1928,
f the
at

has
rec-

ntrol
gnal
en-
ush-
was
., in
year
busi-
nte-
In
y of
any,
d in
he
gnal
and

en-
way
He
was

me connected with
any at Garwood,
nsulting engineer,
promoted to patent
engineer in 1919.
f engineer of the
pany at Albany,
5. In April, 1928,
ng engineer of the
nal Company at

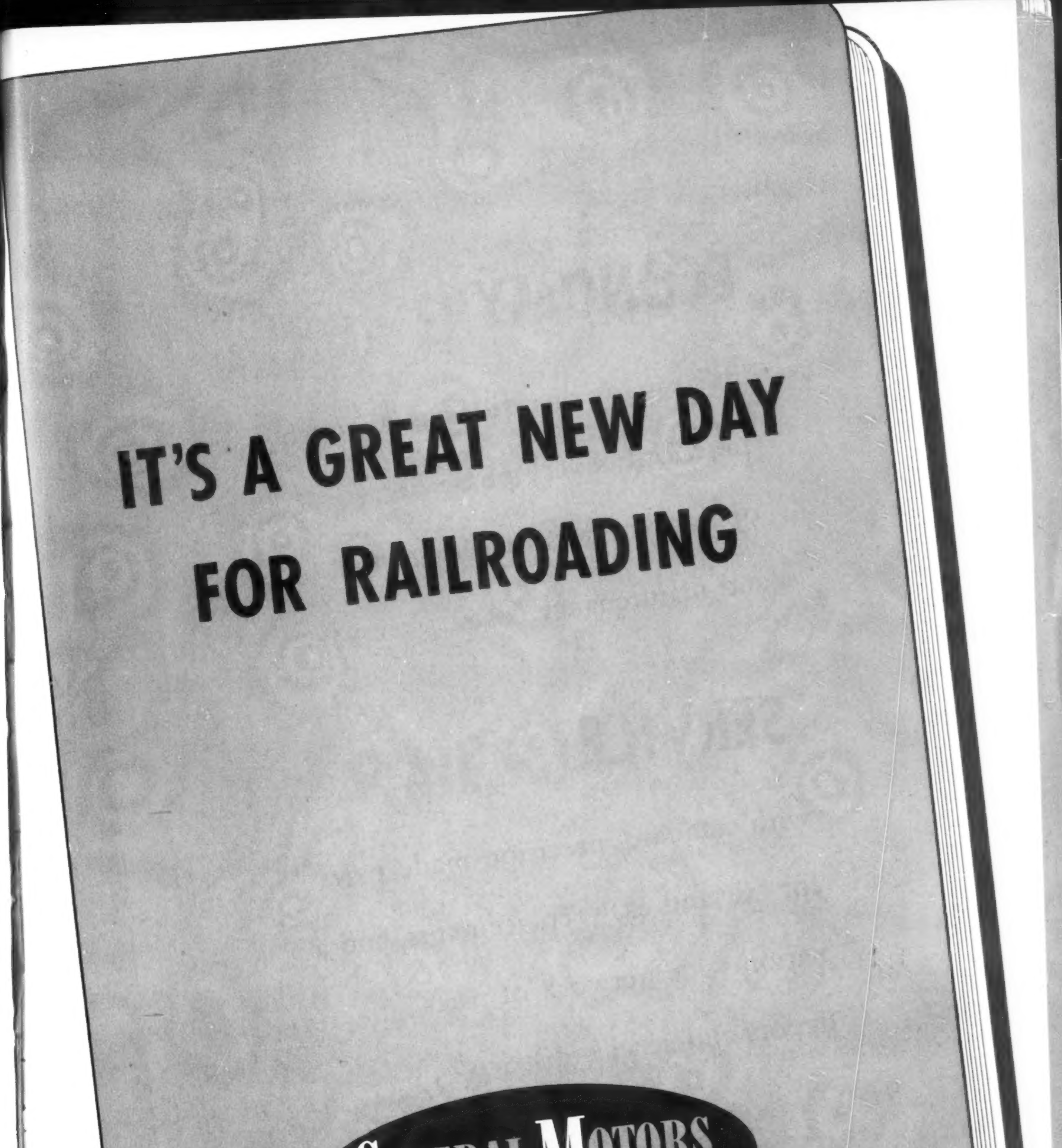
ield

position he has
intment as direc-
search.

l, train control
Railway Signal
oted to chief en-
, 1945. Mr. Bush-
hia, Pa., and was
l College, Pa., in
05. After a year
of the steel busi-
n in the mainte-
Pennsylvania. In
d the employ of
pany at Albany,
later worked in
ent. In 1909 he
man in the signal
York Central, and

shnell

Mr. Bushnell en-
General Railway
as wireman. He
work which was



IT'S A GREAT NEW DAY
FOR RAILROADING
GENERAL MOTORS
LOCOMOTIVES

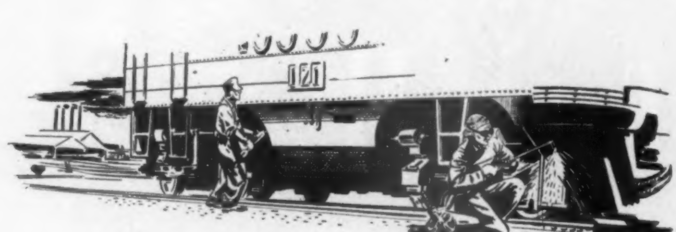
IT'S A GREAT NEW DAY FOR RAILROADING

ECONOMY

in so many directions as to touch practically every phase of operation, including lower fuel and maintenance costs.

SERVICE

with standard, precision-made parts for fast and easy replacements, and a nation-wide network of parts depots and service districts.



IT'S A GREAT NEW DAY FOR RAILROADING

POWER

for more tonnage-hauling capacity
with greater average speed,
and stricter adherence to
regular schedules.

AVAILABILITY

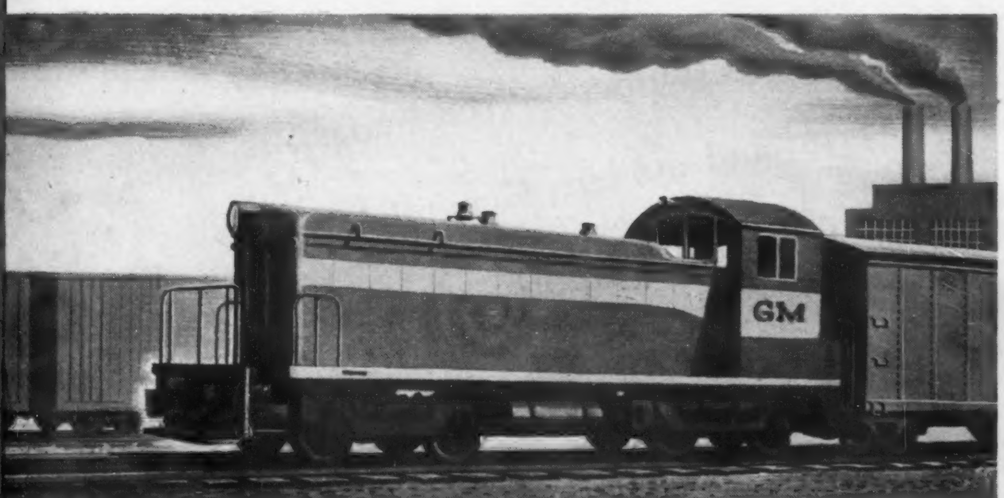
with minimum "times out" for
servicing and repairs. The average
availability of all General Motors
Locomotives is 92%.
Compare this with any other
long-time availability record
with which you are familiar.

IT'S A GREAT NEW DAY FOR RAILROADING

After 7 full years of
peacetime use and
three years of
wartime service
GENERAL MOTORS
DIESEL-ELECTRIC
LOCOMOTIVES
are fully developed
and thoroughly proved
to deliver . . .

In General Motors passenger locomotives the railroads have a tool with which they are raising the whole level of speed, regularity and comfort of passenger service.

Opportunity to establish a whole new conception of the movement of freight is given American railroads by the General Motors Diesel freight locomotive.



The efficiency and savings of General Motors Diesel switching locomotives in yard and terminal clearing indicate complete Dieselization of switching as a postwar certainty.

IT'S A GREAT NEW DAY FOR RAILROADING

COMFORT

because of fast acceleration and smooth starting—permitting power to be exerted quickly and uniformly throughout the entire train.

SAFETY

owing to low center of gravity—as well as to freedom from smoke and steam, with complete vision of track and signals for the enginemen.

GENERA

LOC

followed with three years in the commercial department and three years in export work at Sydney, Australia. From 1920 to the present, Mr. Bushnell has been with the engineering department; the last two years as chief engineer of the company's Genesee plant. Also during the last few months, Mr. Bushnell has been acting as train control engineer at the West Avenue plant.

Benjamin P. Wayne, secretary to the president of the **General Railway Signal Company,** New York City, has been appointed secretary for the company. Mr. Wayne was born July 21, 1892, at Hilton, N. Y. He was educated at the Hilton High School and the Rochester Business Institute. He began his business career in 1912 with the Yawman & Erbe Manufacturing Company and spent three years in the sales department. In 1915 he entered the employ of the General Railway Signal Company at Rochester, N. Y., first as clerk in the commercial department for two years, after which he became employment manager for the following four years. In 1921 he was promoted to secretary to the president and in 1929 he assumed additional duties of assistant secretary to the company, having been transferred to the executive offices in New York. In September, 1943, he was also appointed secretary to Electrons, Inc., retaining all three positions until his recent promotion.

Benjamin P. Wayne

Construction

INTERNATIONAL-GREAT NORTHERN.—This road has awarded a contract amounting to $45,188, to the Schneider Construction Company, Inc., Houston, Tex., for the construction of a freight warehouse at Houston, to replace a similar building destroyed by fire. The warehouse will be of one-story construction, measuring 50 ft. by 388 ft.

LOUISVILLE & NASHVILLE — ILLINOIS CENTRAL.—Upon the request of these roads, Division 4 of the Interstate Commerce Commission has dismissed their respective applications for authority to construct competitive branch lines by which they proposed to serve certain coal mines in the vicinity of Madisonville, Ky. It was indicated that the carriers concerned had come to an agreement for the construction of a spur track by which both will be afforded access to the area. The L. & N. had contemplated construction of a 1.9-mile branch, while the I. C. had proposed to operate a 1.18-mile line to be built by the Chicago, St. Louis & New Orleans, lessor.

NEW YORK CENTRAL.—This company's wholly-owned subsidiary, the Lake Erie, Alliance & Wheeling, has applied to the Interstate Commerce Commission for authority to build a 2.8-mile branch near Hopedale Junction, Ohio, to gain access to coal mines.

Equipment and Supplies

FREIGHT CARS

THE NORTHERN PACIFIC was authorized by its directors, at a meeting in Chicago on December 28, to purchase 1,000 box cars, scheduled for delivery starting in the third quarter of 1945.

The UNION PACIFIC has ordered 1,000 40½-ft. box cars of 50 tons' capacity from the Mount Vernon Car Manufacturing Company for third quarter, 1945 delivery. The inquiry for this equipment was reported in the *Railway Age* of December 23.

The SOUTHERN PACIFIC has ordered 500 40½-ft. box cars of 50 tons' capacity from the Mount Vernon Car Manufacturing Company for third quarter, 1945 delivery.

The ATCHISON, TOPEKA & SANTA FE has ordered 500 box cars of 50 tons' capacity from the Mount Vernon Car Manufacturing Company for third quarter, 1945 delivery.

SIGNALING

The ELECTRO-MOTIVE CORPORATION has ordered 50 sets of intermittent inductive train control equipment from the General Railway Signal Company to equip 15 Diesel locomotives for the Atlantic Coast Line and Florida East Coast, 14 for the Baltimore & Ohio, 8 for the Southern, 7 for the New York Central, 4 for the Lehigh Valley, and 2 for the Pere Marquette. In addition, 5 sets of continuous inductive train control equipment have been ordered to equip 5 Diesels for the Chicago & North Western.

SWISS RAILWAY INSTRUCTION.—A number of Swiss schoolmasters are reported to have met recently in the main railway station, at Zurich, to formulate plans for stimulating an interest among senior pupils in Swiss secondary schools in the railways of their country. By lantern slides and films, a Federal Railways' representative illustrated how railway matters might best be presented to young people. This report from the Railway Gazette (London) would suggest that such instruction in Swiss schools may be not unlike the program for informing school children about railroading which has been inaugurated by the New Haven in New England elementary schools. (See *Railway Age,* October 28, page 671.)

Financial

BALTIMORE & OHIO.—*Promissory Note.*—This company has applied to the Interstate Commerce Commission for authority to issue $720,000 of series H promissory notes in connection with its purchase from the Greenville Steel Car Co., under a conditional sale arrangement, of 200 50-ton automobile box cars at an aggregate cost of $818,734.

BALTIMORE & OHIO.—*Acquisition.*—Division 4 of the Interstate Commerce Commission has authorized this company to purchase for $6,500 about 9,490 ft. of the line of the Monongahela West Penn Public Service Co. at Hartland, W. Va., a suburb of Clarksburg, on which it has operated under trackage rights.

BARRE & CHELSEA.—*Merger of Montpelier & Wells River.*—This company and Alvin F. Sortwell, owner of 60 per cent of its capital stock, have been authorized by Division 4 of the Interstate Commerce Commission to purchase and operate the properties of the Montpelier & Wells River, and the Chelsea has been authorized to issue a first mortgage non-negotiable 4 per cent promissory note for $345,000 to be delivered to the Wells River in payment therefor. This note is then to be delivered to the Boston & Maine, direct and indirect owner of substantially all the stock of the Wells River and of 40 per cent of the stock of the Chelsea, to replace a presently outstanding 4½ per cent note of the Wells River, of equal principal amount, which it holds. Payment of the new note in proportion to the net profits of the combined lines is provided for.

CHICAGO & NORTH WESTERN.—*Promissory Notes.*—This company has asked the Interstate Commerce Commission to authorize the issue of $3,261,396 of 1⅞ per cent promissory notes in connection with the purchase of 28 Diesel-electric locomotives. The bid of the First National Bank of Chicago and others for these notes has been accepted conditionally. Financing of five of these locomotives was authorized as part of the road's 1944 equipment purchase program, but delivery was delayed. It has not asked that the covering authorization be transferred to the 1945 program. This transfer would apply to one 2,000-hp. passenger locomotive ordered from the electro-motive division, General Motors Corporation, one 660-hp. switcher ordered from the American Locomotive Company at a cost of $59,750, and three 44-ton switchers ordered from the Whitcomb Locomotive Company at an aggregate cost of $113,520. In addition to this carry-over from 1944, the company expects to acquire 23 additional Diesel-electric locomotives this year, according to the application. Four more 2,000-hp. passenger locomotives are to be bought from the Electro-Motive Division, General Motors Corporation, making the aggregate outlay for this type of equipment $912,060. Two 5,400-hp. freight locomotives from the same builder will cost a total of $1,028,672. The Baldwin Locomotive works is to supply seven

1,000-hp. switchers at an aggregate cost of $549,681 and ten 660-hp. switchers at a total cost of $597,710. The commission was informed that additional purchases are contemplated, bringing the total 1945 program to $3,500,000, provided commitments for delivery can be secured.

CHICAGO, ROCK ISLAND & PACIFIC-COLORADO & SOUTHERN.—*Lease of Burlington-Rock Island.*—In a proposed report, Examiner R. R. Molster has recommended that Division 4 of the Interstate Commerce Commission approve "in principle" the proposal of these roads and their respective subsidiaries, the Chicago, Rock Island & Gulf and the Fort Worth & Denver City, to operate jointly under lease the line from Teague, Tex., to Galveston, of the Burlington-Rock Island, all stocks and bonds of which are owned in equal portions by the C. & S. and C. R. I. & G. The C. & S. is controlled by the Chicago, Burlington & Quincy, and the Burlington and Rock Island systems already operate as joint lessees the B.-R. I. line from Waxahachie, Tex., to Teague, 67 miles. The proposed lease arrangement would eliminate the B.-R. I. as an operating company, with the proprietary lines taking over operation, as lessees, of its owned line from Teague to Houston, 144 miles, and a branch from Teague to Mexia, 14 miles, as well as its trackage rights over the Gulf, Colorado & Santa Fe line from Houston to Galveston. Annual fixed rental for the entire line would be $375,000, as against $126,000 heretofore paid for use of a portion of the property.

The B.-R. I. also operates over lines of the Houston Belt & Terminal at Houston, owns one-fourth of the terminal company's stock, and has advanced one-fourth of the amount owed by it to its proprietary companies. Two subsidiaries of the Missouri Pacific and the G. C. & S. F. likewise each have a one-fourth interest in the terminal company. The Missouri Pacific has objected to approval of the lease arrangement on the ground that it would constitute an invasion by the proposed lessees of territory served by it, and that transfer of the rights of the B.-R. I. in the terminal company to the proposed lessees cannot be accomplished without the consent of the other proprietors of the terminal company.

The examiner also pointed out that the Burlington and Rock Island are not certain whether or not consummation of the lease agreement would result in a new division of the capital expense and stock ownership of the terminal, that is, whether they together would acquire the one-fourth interest held by the B.-R. I. or whether each of them, and the other three companies involved, would acquire a one-fifth interest. These questions are within the jurisdiction of the courts, not of the commission, the examiner held. However, he added, "with the controversy in existence, the term and conditions on which the applicants may acquire the right to use the terminal company's facilities, or some other facilities, at and through Houston are at least uncertain; and, with such uncertainty present, the commission is not now in a position to make the findings required." Therefore he recommended approval of the proposal "in principle," with entry of an order authorizing it to be deferred until terms and agreements as to the Houston situation are worked out and presented to the commission.

This recommendation was arrived at after the examiner had concluded that the record did not afford a basis for a finding that a change in the name of the operator of the trains using the line involved would enable the Burlington and Rock Island to "influence the movement of Houston traffic to any greater extent than they are able to do with the operation to, from and at Houston now conducted in the name of their jointly controlled subsidiary."

DELAWARE, LACKAWANNA & WESTERN.—*Oswego & Syracuse Merger.*—The Delaware, Lackawanna & Western and the Oswego & Syracuse have reached an accord on the principal elements of a plan for merger intended to bring about a settlement of pending tax litigation and future tax problems. A summary of the more important provisions of the plan follows: Oswego & Syracuse stockholders will receive for each share of $50 par value stock, $18.50 in cash plus $50, principal amount, of new bonds of the Lackawanna secured by a first mortgage on Oswego & Syracuse properties. The new bonds will bear 4 per cent fixed interest payable from February 20, 1943, when rental payments stopped, and 2 per cent contingent interest payable out of system net earnings, subordinated to contingent interest on any securities issued for the stock of the Lackawanna, but sharing pro rata with contingent interest on any securities issued for stock of other leased line companies. The contingent interest will be deferred and not accrue, whether earned or not, until such time as the amount equals one-half of federal income taxes assessed against the Oswego & Syracuse to the date of the merger and will be cumulative up to the amount of three years' interest unpaid.

The new bonds will mature in 50 years and be redeemable at 105. After approval by the directors, the plan must be submitted to the Interstate Commerce Commission for authorization and to the stockholders for approval.

MISSOURI PACIFIC.—*D. & R. G. W. Stock.*—The Federal District Court at St. Louis, Mo., has authorized the trustee of the Missouri Pacific to appeal from an order of the District Court of Denver, Colo., confirming the plan of reorganization for the Denver & Rio Grande Western. The petition of the trustee stated that the M. P. holds title to half of the no par common stock of the Rio Grande, $608,800 of the preferred stock, and $1,000,000 of the refunding and improvement mortgage bonds and that under the plan of reorganization the common and preferred stock were held to have no value while the bonds would be redeemed at 17.7 per cent of face value.

NEW YORK, CHICAGO & ST. LOUIS.—*Bonds.*—Division 4 of the Interstate Commerce Commission has authorized this company to issue $42,000,000 of series D refunding mortgage 3¾ per cent bonds, sold at 100.529 to Halsey, Stuart & Co. and others, making the average annual cost to the company 3.72 per cent. (Previous item in *Railway Age* of December 2, page 869.)

NEW YORK, NEW HAVEN & HARTFORD.—*Balloting on Reorganization Plan.*—Division 4 of the Interstate Commerce Commission has certified the results of balloting by specified classes of creditors to whom the plan of reorganization of this company and three affiliated companies was submitted for acceptance or rejection. In addition to the New Haven, the companies involved were the Old Colony; Hartford & Connecticut Western; and Providence, Warren & Bristol.

Ballots were returned by 13 classes of creditors, of which one showed a majority for rejection of the plan. The other 12 accepted it by varying percentages of the total vote. Creditors giving 100 per cent approval were the Reconstruction Finance Corporation and Railroad Credit Corporation, holders of $6,526,935 of New Haven secured notes; the holders of $1,711,000 of New Haven & Northampton refunding consolidated mortgage bonds; and the public holders of Providence, Warren & Bristol stock. Five other classes of creditors gave votes in excess of 90 per cent in favor of approval; namely, 93.95 per cent of the holders of $10,386,000 of New England Railroad consolidated mortgage bonds; 99.2 per cent of the holders of $1,382,000 of Boston & New York Air Line first mortgage bonds; 98.6 per cent of the holders of $7,306,000 of Central New England first mortgage bonds; 96.3 per cent of the holders of $65,122,100 of New Haven first and refunding mortgage bonds; and 99.54 per cent of the holders of $6,525,672 of New Haven 6 per cent 15-year secured bonds.

More substantial opposition to acceptance was indicated among 4 classes of creditors; namely, by 35.99 per cent of the holders of $992,000 of Housatonic Railroad consolidated mortgage bonds; by 14.96 per cent of the holders of $127,000 of Danbury & Norwalk first refunding mortgage bonds; by 32.65 per cent of the public holders of Hartford & Connecticut Western stock; and by 18.45 per cent of the holders of $14,311,458 of other allowed claims. Certain ballots of most classes were found to be defective by the division, but in relatively small percentages of the total vote. The vote of the holders of $9,969,000 of Old Colony first mortgage obligations was 50.6 per cent against acceptance of the plan.

PENNSYLVANIA. — *Pennroad Judgment Reversed.*—On December 28, the Third United States Circuit Court of Appeals set aside the $22,104,515 judgment against the Pennsylvania which the United States district court at Philadelphia, Pa., awarded to the Pennroad Corporation on January 19, 1943 and ordered a judgment entered in favor of the Pennsylvania. The reversal, by a two to one vote, was primarily on the ground that the plaintiffs filed their suit too late and failed to prove any breach of trust, dereliction of duty, or conspiracy on the part of the officers and directors to misuse Pennroad's funds for the benefit of the Pennsylvania.

PORT TOWNSEND SOUTHERN.—*Ownership.*—R. S. Fox, president of the Seattle

News Department continued on next left-hand page

Export Lumber Company, has applied to the Interstate Commerce Commission for authority to acquire as an individual the physical property of this road, which extends from Port Townsend, Wash., to Discovery Junction. In addition to $15,000 in cash, he would pay $100,000 within three years, with 3 per cent interest on the unpaid portion thereof.

WISCONSIN CENTRAL.—*Reorganization Plan.*—A committee for holders of this company's first general mortgage 4 per cent bonds has submitted to the Interstate Commerce Commission a proposed plan for reorganization under section 77 of the Bankruptcy Act. New capitalization would total $48,127,190, as compared to the old company's $85,233,072 (including accrued charges). Of this total, fixed-interest obligations would amount to $10,044,028, contingent-interest debt to $12,651,401, and no-par capital stock, stated at $100 per share, to $25,431,761. Total charges before dividends on the new capitalization would aggregate $1,138,724 annually, of which fixed charges would be $459,481, contingent interest $569,313, and capital retirement provisions $109,930.

The bondholders' plan makes no provision for participation of the old company's equity holders in the reorganization, and their stock would be found without value. Substantially all of this stock was held by the Minneapolis, St. Paul & Sault Ste. Marie, lessee of the old company's property, and operator thereof, as agent, during the period of its receivership. The new company's interest-bearing obligations, apart from undisturbed outstanding issues (equipment obligations and 4 per cent Marshfield & South Eastern division mortgage bonds), would be allotted entirely to holders of old general mortgage 4's, who would receive, for each $1,000 bond, $450 in new first mortgage 4 per cent bonds, $626 in general mortgage income 4½ per cent bonds, and $190 in cash. Other old company bonds would be allotted new company stock, in amounts equal to or in excess of the principal amount of the old securities.

Trustees.—Division 4 of the Interstate Commerce Commission has ratified the appointment of Edward A. Whitman and Edgar F. Zelle as trustees of this company's property in reorganization proceedings under section 77 of the Bankruptcy Act.

Dividends Declared

Carolina, Clinchfield & Ohio.—$1.25, quarterly, payable January 20 to holders of record January 10.

Clearfield & Mahoning.—$1.50, semi-annually, payable January 2 to holders of record December 20.

East Pennsylvania.—$1.50, semi-annually, payable January 16 to holders of record December 30.

Fonda, Johnstown & Gloversville.—resumed, 50¢, payable January 20 to holders of record December 21.

Northern Pacific.—$1.00, payable February 1 to holders of record January 8.

Paterson & Hudson River.—$1.00, payable January 15 to holders of record December 31.

Piedmont & Northern.—50¢, quarterly, payable January 20 to holders of record January 5.

Reading.—25¢, quarterly, payable February 8 to holders of record January 11.

Schuylkill Valley Navigation & RR.—$1.25, semi-annually, payable January 11 to holders of record December 29.

Average Prices Stocks and Bonds

	Jan. 2	Last week	Last year
Average price of 20 representative railway stocks..	48.07	47.64	35.64
Average price of 20 representative railway bonds..	93.72	93.15	81.32

Abandonments

Brotherhoods Want Protective Conditions Specified

Pointing out that the Interstate Commerce Commission has reserved jurisdiction for the protection of any employees adversely affected by abandonment of rail lines, pursuant to authority granted by it, in about 100 recent proceedings, the Railway Labor Executives Association has petitioned the commission to reopen and reconsider certain of these proceedings in which the customary 2-year reservation of jurisdiction is about to expire. Such reconsideration should result either in the imposition of specific conditions similar to those set forth in the recent Burlington abandonment report of Division 4, Finance Docket No. 14426, said the unions' petition, or at least in a further reservation of jurisdiction for 2 years more. The petition was based on the contention that under present conditions of manpower shortages, employees who might have been affected by abandonments have been offered other employment, but that the tenure of such employment under more normal conditions is questionable.

The protective conditions prescribed in the Burlington case were outlined in *Railway Age* of November 18, 1944, page 799. Their effect is to give the employee assurance of receiving aggregate monthly compensation for four years at the rate of pay prevailing on the job affected by the abandonment, whether or not he is otherwise employed; to maintain his pension and relief privileges for that time; and to reimburse him for any loss sustained in connection with disposal of real estate resulting from his transfer to another place of employment in consequence of the abandonment. The Burlington's objection to the imposition of these conditions, and its request for consideration by the full commission of this "fundamental and far-reaching" change in commission practice, was noted in *Railway Age* of December 9, 1944, page 904. No action had been taken on this request by the commission when this issue went to press.

The union heads filed petitions for the reopening of six abandonment cases in which Division 4 early in 1943 had granted authority to abandon the lines concerned, with the 2-year reservation of jurisdiction as to affected employees. In each case the R. L. E. A. at the same time petitioned for authority to intervene in these proceedings, to which it had not originally been a party. The proceedings involved are: F. D. 14003 (New York Central-Michigan Central), 13831 (Atchison, Topeka & Santa Fe-New Mexico Central), 14082 (Chicago, Milwaukee, St. Paul & Pacific), 13937 (Pere Marquette), 13938 (Southern Pacific-Central Pacific), and 13942 (Chicago, Milwaukee, St. Paul & Pacific).

At the same time, the Brotherhood of Locomotive Engineers and Brotherhood of Railroad Trainmen jointly petitioned the commission to reopen and reconsider another abandonment proceeding—F. D. No. 14001, involving an authorization granted the Chicago, Milwaukee, St. Paul & Pacific with a similar reservation of jurisdiction as to employees—in order to "give consideration to terms and conditions" for the protection of those adversely affected, if any.

The general argument of the R. L. E. A. petitions was to the effect that no harm would be done by defining the conditions if no employees were adversely affected, as they would not be applicable. However, it continued, in cases where claims of adverse effect were entered and supported, such provisions would be on record. Rather than to wait until such claims are filed *en masse*, it was suggested, the commission should detail the conditions in advance, as they would be effective only when need was shown.

MISSOURI PACIFIC.—Upon petition of the Nebraska States Railway Commission and others interested, Division 4 of the Interstate Commerce Commission has set aside its order authorizing this road's subsidiary, the Missouri Pacific in Nebraska, to abandon a portion of a branch from Talmage, Neb., to Crete, 58.1 miles, and has reopened the proceeding for further hearing as to more recent revenue and expense data. As noted in *Railway Age* of September 23, page 497, the abandonment authorization was effective one year after the date of the certificate (September 16). In advance of the further hearing, the carrier is required to permit protestants to examine division sheets pertaining to the distribution of revenues on traffic movements in which this line is involved.

Railway Officers

EXECUTIVE

Gerard B. Townsend, formerly with the Union Trust Company of Pittsburgh (Pa.) and Lazard Freres & Co., New York, has been appointed assistant to the president of the Erie at Cleveland, Ohio.

G. M. Cornell has been appointed assistant to the president of the Virginian with headquarters at Norfolk, Va., succeeding Lemuel A. Markham, whose death on November 27 was reported in the *Railway Age* of December 2.

G. E. Durham, superintendent, motive power and cars, of the Wheeling & Lake Erie at Brewster, Ohio, has been appointed assistant vice-president, reporting to the executive vice-president and general manager, with headquarters at Cleveland, Ohio.

Edward E. Hopper, special representative in the traffic department of the Pittsburgh & West Virginia at Pittsburgh, Pa., has been appointed assistant to the president with the same headquarters, succeeding **Albert H. Graham,** who has been named assistant to the vice-president—traffic there.

Frank A. Thompson, co-trustee of the St. Louis-San Francisco, has been ap-

News Department continued on next left-hand page

pointed sole trustee and chief executive officer, with headquarters as before at St. Louis, effective January 1. Mr. Thompson's appointment as sole trustee of the company was made by Federal Judge George H. Moore, following the resignation of **J. M. Kurn,** who was former co-trustee with Mr. Thompson.

John R. Smith, superintendent, communications, of the Southern at Charlotte, N. C., has been named assistant to the vice-president, communications, at Washington, D. C., succeeding **James A. Jones,** who has retired after 54 years of railroad service. A photograph of Mr. Jones and a biographical sketch of his railroad career appeared in the June 17, 1944, issue of *Railway Age,* at the time of his appointment as assistant to vice-president.

FINANCIAL, LEGAL AND ACCOUNTING

D. M. Kerr has been appointed auditor of the Central Vermont.

R. S. Bishop, car accountant of the Boston & Maine and the Maine Central at Boston, Mass., has been named assistant to the comptroller there.

M. G. Chew, assistant cashier of the Southern, has been promoted to cashier with headquarters at Washington, D. C., succeeding **W. P. Hopper,** who has retired after nearly 50 years of service.

J. W. Severs, assistant comptroller and assistant to the trustee of the Chicago, Milwaukee, St. Paul & Pacific at Chicago, has been promoted to executive assistant and comptroller, with the same headquarters, succeeding to the duties of **Walter V. Wilson,** whose retirement was reported in the *Railway Age* of December 23. Mr. Severs was born at Alexis, Ill., on December 26, 1890. He entered railway service in 1912 as a clerk of the Chicago & North Western at Chicago, and in 1914 he was advanced to division accountant. In 1917 Mr. Severs went with the Milwaukee as a traveling accountant, with headquarters at Chicago, later being promoted to auditor of expenditures and to assistant comptroller, with the same headquarters. In 1939 he was advanced to assistant to the trustee, still retaining his duties as assistant comptroller, the position he held at the time of his new appointment.

J. W. Severs

R. S. Claar, real estate and land commissioner of the Minneapolis, St. Paul & Sault Ste. Marie, has been appointed industrial and real estate commissioner, with headquarters as before at Minneapolis, Minn.

William A. Catanach, special representative, office of the vice-president, of the Western region of the Pennsylvania with headquarters at Chicago, has been appointed special assistant in the legal department at Philadelphia, Pa.

W. E. Kelley, chief clerk to the assistant comptroller of the Chesapeake & Ohio, has been appointed general accountant at Richmond, Va. **R. M. Hunter,** assistant to the comptroller at Richmond, retired on December 31 after more than 43 years of service.

TRAFFIC

James S. Anderson, passenger agent in the office of the general agent of the Southern Pacific at New York, has resigned after nearly 33 years of service.

L. Corner, traffic representative of the Canadian National, has been promoted to district freight and passenger agent, with headquarters as before at Vernon, B. C.

P. A. Schumbert, district passenger agent of the Southern at New York, has been appointed division passenger agent with the same headquarters.

J. J. Hubbard, commercial agent of the Southern at Richmond, Va., has been appointed district freight agent at Boston, Mass.

J. K. Weston has been appointed assistant general freight and passenger agent of the Toronto, Hamilton & Buffalo, at Hamilton, Ont.

William P. Redmond, district passenger agent of the Pennsylvania, with headquarters at Chicago, has retired after nearly 52 years of service.

A. M. Baker, division freight agent of the Seaboard Air Line at Birmingham, Ala., has been appointed assistant general freight agent there, and his former position has been abolished.

Fred Sorbe has been appointed general agent, freight department, of the Delaware & Hudson at Pittsburgh, Pa., succeeding **Thomas Byers,** deceased.

V. E. Buchanan, traveling freight and passenger agent of the Union Pacific, with headquarters at Eugene, Ore., has been promoted to general agent, with headquarters at Yakima, Wash.

Michael J. McGill, assistant general freight agent of the Boston & Maine and the Maine Central at Boston, Mass., has been appointed general freight agent with the same headquarters. **Andrew Cooper** has been named to succeed him as assistant general freight agent.

A. J. Wyant, general agent of the Akron, Canton & Youngstown at Pittsburgh, Pa., has been named assistant general freight agent with the same headquarters.

J. A. Wilson has been appointed assistant to the freight traffic manager of the Seaboard Air Line with headquarters at Norfolk, Va.

Walter H. Lancton, city freight agent of the Lehigh Valley at New York, has been appointed to the newly-created position of foreign freight traffic manager of that road, with headquarters at New York. Mr. Lancton's new position will include the duties heretofore under the jurisdiction of **George N. Whelpley,** foreign freight agent, who has retired.

Robert C. Duffin, assistant to the traffic manager of the Missouri-Kansas-Texas at St. Louis, Mo., has been promoted to general agent, with headquarters at Detroit, Mich., succeeding W. L. Peebles, whose death on November 23 was reported in the *Railway Age* of December 16.

H. G. Feth, freight traffic manager of the Chicago & Eastern Illinois at Chicago, has been promoted to coal traffic manager, with the same headquarters, a newly-created position. **H. H. Washer,** general coal agent, has been advanced to assistant general freight agent, with headquarters as before at Chicago.

William D. Sunter, chief clerk to the freight traffic manager of the Chicago, Milwaukee, St. Paul & Pacific at Chicago, has been promoted to assistant general freight agent, with the same headquarters, succeeding **Milton F. Edbrooke,** who has resigned from the Milwaukee to become a member of the Standing Rate committee of the Transcontinental Freight Bureau, with headquarters at Chicago.

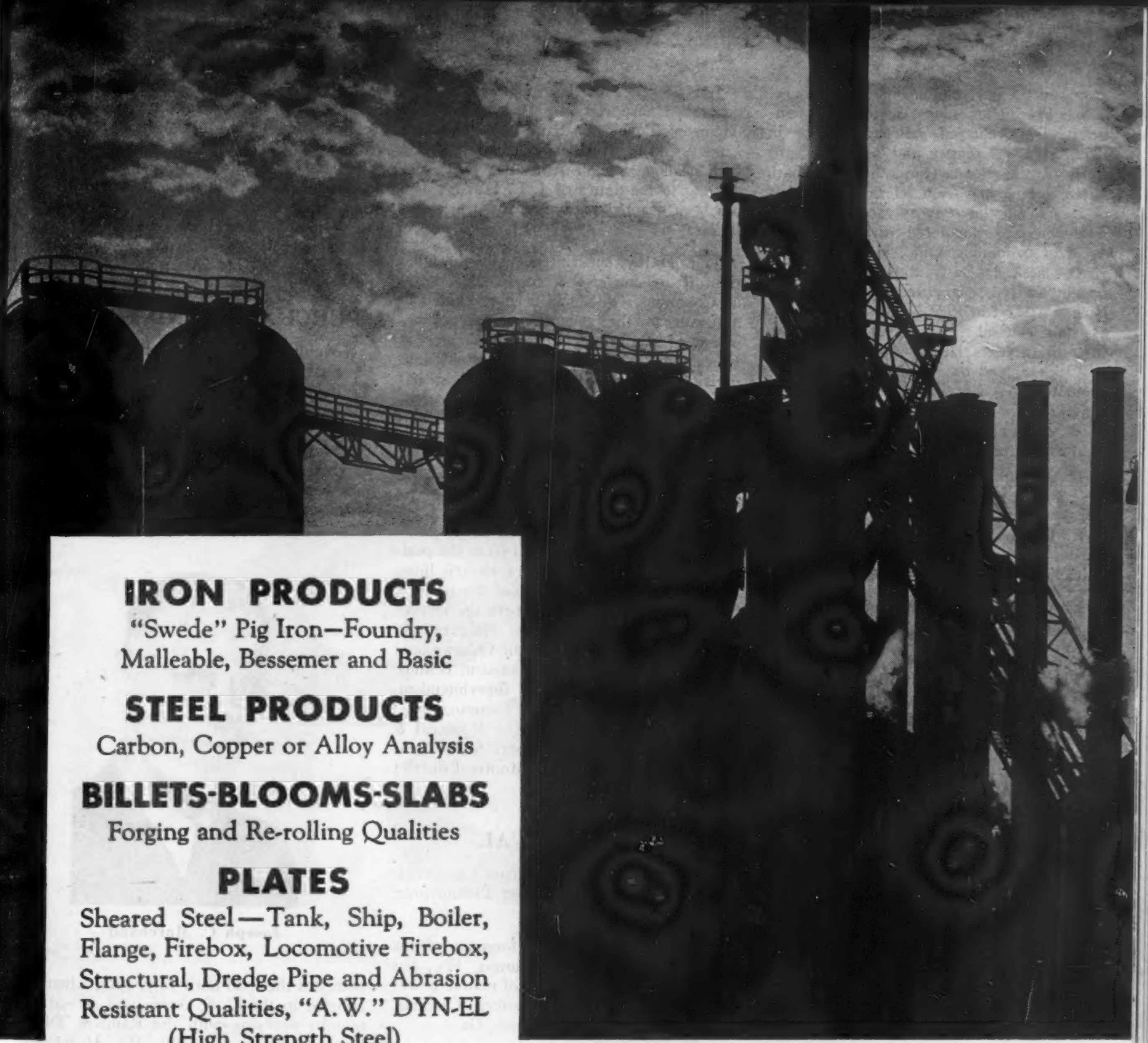
Hugh S. Wilson, general agent of the Lehigh Valley at Chicago, has been promoted to assistant general freight agent, with headquarters at Detroit, Mich. **M. J. Vandewalker,** general agent at Cincinnati, Ohio, has been transferred to Indianapolis, Ind., replacing **G. B. Peterson,** who in turn succeeds Mr. Wilson at Chicago.

H. J. McKenna and **B. R. Dolphin** have been appointed assistant general freight agents of the Minneapolis, St. Paul & Sault Ste. Marie, handling rates and divisions respectively, with headquarters at Minneapolis, Minn. **G. E. Forrest,** contracting freight agent at Chicago, has been advanced to general agent, with the same headquarters.

George F. Stanton, general eastern passenger agent of the New York Central at New York, has been named assistant general passenger agent with the same headquarters, succeeding Adolph L. Miller, whose death on November 23 was reported in the December 2 issue of *Railway Age.* **Carroll O. B. Brown,** ticket agent at the Grand Central Terminal, New York, has been named general eastern passenger agent there to replace Mr. Stanton.

Frederick W. Nash, assistant freight traffic manager of the Pennsylvania with headquarters at Chicago, has retired after 52 years of service. Mr. Nash was born

News Department continued on next left-hand page



IRON PRODUCTS
"Swede" Pig Iron—Foundry, Malleable, Bessemer and Basic

STEEL PRODUCTS
Carbon, Copper or Alloy Analysis

BILLETS-BLOOMS-SLABS
Forging and Re-rolling Qualities

PLATES
Sheared Steel—Tank, Ship, Boiler, Flange, Firebox, Locomotive Firebox, Structural, Dredge Pipe and Abrasion Resistant Qualities, "A.W." DYN-EL (High Strength Steel)

SHEETS
Hot Rolled Sheets for every purpose
"A.W." DYN-EL (High Strength Steel)

"A.W." ROLLED STEEL FLOOR PLATE
Super-Diamond, Standard Diamond, Diamondette, Sunken Diamond and Ribbed Pattern

READING BRAND "A.W." CUT NAILS
Black—Quenched and Tempered—Galvanized

"A.W." Quality PRODUCTS

To insure the *quality* of "A.W." Products, *controls* extend from our own mines, through all stages of manufacture, to the finished product. If you have a problem requiring either carbon or alloy steels, our Metallurgical Department is at your command.

ALAN WOOD STEEL COMPANY

MAIN OFFICE AND MILLS: CONSHOHOCKEN, PENNSYLVANIA : SINCE 1826. District Offices and Representatives: Philadelphia, New York, Boston, Atlanta, Buffalo, Chicago, Cincinnati, Cleveland, Denver, Detroit, Houston, St. Paul, New Orleans, Pittsburgh, Roanoke, Los Angeles, San Francisco, Seattle, Montreal.

near West Liberty, Ohio, in 1874, and received his higher education at Ohio University. He entered railroad service in 1892, as a messenger and assistant yard clerk of the Pennsylvania at Cincinnati. After serving in various clerical and other positions on the Pennsylvania's western lines, he was appointed division freight agent at Columbus, Ohio, in 1918. Three years later he was appointed division freight and passenger agent at Chambersburg, Pa., and in 1922 he was advanced to assistant general freight agent at St. Louis, Mo. Four years later he was transferred to Chicago, and on April 1, 1933, he was promoted to general freight agent at the same point. On October 16, 1936, Mr. Nash was advanced to the position he held at the time of his retirement.

OPERATING

R. J. Barnes has been appointed trainmaster of the New York Central's Pennsylvania division at Jersey Shore, Pa.

Lloyd Crocker has been appointed superintendent of the Atlantic Coast Line at Wilmington, N. C.

Thomas L. Doyle, assistant to the general manager, Western Region, of the Pennsylvania, with headquarters at Chicago, has retired after more than 41 years of service.

J. W. Hollis, auditor of the Laurinburg & Southern at Laurinburg, N. C., has assumed the additional duties of assistant general manager and traffic manager, succeeding **G. Y. Jones,** who has retired.

W. S. Moore, division engineer of the Louisville & Nashville at Louisville, Ky., has been appointed acting superintendent of the Louisville division with the same headquarters, succeeding **S. H. Fulkerson,** who has been granted a leave of absence.

W. C. Stallard has been named car accountant of the Boston & Maine and Maine Central at Boston, Mass., succeeding **R. S. Bishop,** whose appointment as assistant to the comptroller is announced elsewhere in these columns.

T. J. McLernon, supervisor of stations of the Lehigh Valley at Bethlehem, Pa., has been named manager of lighterage and stations, New York Harbor. **J. J. Kearney** has been named supervisor of stations at Bethlehem succeeding Mr. McLernon.

W. A. Shea has been appointed trainmaster of the New York Central's St. Lawrence, Ottawa, and Adirondack divisions at Watertown, N. Y., and **S. T. Keiley** has been named trainmaster of the electric, Harlem, and Putnam divisions at New York.

H. R. Hughes, superintendent of the Western division of the Southern Pacific at Oakland Pier, Cal., has been promoted to assistant general manager, with headquarters at San Francisco, Cal. **E. D. Moody,** assistant to the general manager, with headquarters at San Francisco, has been advanced to superintendent of the Western division, succeeding Mr. Hughes.

J. H. Rapier has been appointed acting general transportation inspector of the Atchison, Topeka & Santa Fe (Western Lines), and of the Panhandle & Santa Fe, with headquarters at Amarillo, Tex., succeeding to the duties of **J. L. Hardy,** who has been granted a leave of absence due to illness.

J. J. Daley, superintendent of the Ohio Central division of the New York Central at Columbus, Ohio, has been promoted to assistant to the general manager, Lines West of Buffalo, with headquarters at Cleveland, Ohio. **J. H. Spooner,** assistant division superintendent at Columbus, has been advanced to superintendent, succeeding Mr. Daley. **E. C. Johnson,** trainmaster at Erie, Pa., has been promoted to assistant superintendent of the Western division, with headquarters at Chicago, relieving **J. W. Crowley,** who replaces Mr. Spooner at Columbus.

E. B. Walker has retired from the position of general superintendent, electric lines, of the Canadian National, and the position has been abolished. Henceforth the respective superintendents of the Niagara, St. Catharines & Toronto and the Oshawa, and the general agent of the Thousand Islands, will report to the general superintendent, Southern Ontario district, Toronto, Ont.; and the superintendent of the Montreal & Southern Counties will report to the general superintendent of the Montreal district, at Montreal, Que.

MECHANICAL

A. O. Geertz has been named fuel engineer of the Pennsylvania at Philadelphia, Pa.

E. G. Jones, general foreman of the Atlantic Coast Line at Tampa, Fla., has been named superintendent of motive power of the Charleston & Western Carolina, with headquarters at Augusta, Ga.

S. O. Rentschler, mechanical superintendent of the Missouri Pacific, has been promoted to assistant chief mechanical officer, with headquarters as before at St. Louis, Mo.

David Beath, acting master mechanic of the Canadian Pacific at Moose Jaw, Sask., has been promoted to master mechanic of the Saskatchewan district, with the same headquarters.

B. W. Pewestorff, road foreman of engines of the Chicago & North Western at Chicago, has been promoted to supervisor of motor car equipment, with the same headquarters, succeeding **C. B. Cotton,** who has retired.

H. L. Ferguson, road foreman of engines of the Union Pacific, has been promoted to general mechanical inspector, with headquarters at Cheyenne, Wyo. **H. L. Crane,** assistant master mechanic at Pocatello, Idaho, has been advanced to master mechanic, with headquarters at Spokane, Wash.

J. O. Hill, assistant superintendent, motive power and cars, of the Wheeling & Lake Erie at Brewster, Ohio, has been promoted to superintendent, motive power and cars, with the same headquarters, succeeding **G. E. Durham,** whose appointment as assistant vice-president is announced elsewhere in these columns. **R. J. Snyder,** general foreman, car department, at Brewster, has been named assistant superintendent, motive power and cars, there to replace Mr. Hill.

PURCHASES AND STORES

Joseph C. Marchand, whose promotion to general storekeeper of the Western Pacific, with headquarters at Sacramento, Cal., was reported in the *Railway Age* of December 16, was born at Plymouth, Cal., on March 26, 1894, and entered railway service with the Western Pacific as shipping clerk at the Portola store, Plumas County, Cal., in February, 1915. He held a number of minor positions at various

Joseph C. Marchand

points of the road until July, 1917, when he enlisted in the U. S. Army and served 16 months overseas with the Rainbow Division. On May 12, 1919, Mr. Marchand returned to the Western Pacific as an assistant accountant, with headquarters at Sacramento, subsequently serving as invoice clerk, head stock clerk, chief store accountant, inspector of stores and acting chief clerk. On December 1, 1941, Mr. Marchand was promoted to chief clerk of the stores department, with the same headquarters, the position he held at the time of his new appointment.

SPECIAL

M. R. Cring, secretary to the chairman of the board of the Missouri-Kansas-Texas, with headquarters at St. Louis, Mo., has been promoted to director of publicity-advertising, with the same headquarters, succeeding **Walter A. Johnson,** who has been assigned to other duties.

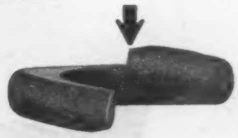
OBITUARY

L. Edward Lundberg, supervisor of wage schedules of the Chicago, Rock Island & Pacific, with headquarters at Chicago, died in a hospital in that city on December 29.

Reliance HY-CROME *Spring Washers*

The MOTIVE POWER *Line*

● ***Locomotive Hy-Crome*** Spring Washers, improved and refined from their original design, are more effectively than ever, successfully overcoming the possibility of loose bolt conditions, and eliminating costly shopping expense. A specific Spring Washer for each specific bolt size made from alloy steel and doing a satisfactory job on heavy railroad and industrial equipment. All ***Locomotive Hy-Crome*** Spring Washers provide parts protection through ground deflection. .



"Tension There In Spite of Wear"

LOCOMOTIVE HY-CROME

Bolt Thread Diam.	Section Size Wid. C.	Section Size Thk. D.	Max. I. D. A.	Max. O. D. B.	Approx. Quantity In A Keg
1/4	5/32	3/32	9/32	39/64	35,000
5/16	11/64	7/64	11/32	45/64	30,000
3/8	3/16	1/8	27/64	53/64	17,000
7/16	7/32	5/32	31/64	59/64	12,000
1/2	5/16	3/16	35/64	1 3/16	5,000
5/8	11/32	7/32	11/16	1 3/8	2,500
3/4	3/8	1/4	13/16	1 9/16	2,200
7/8	7/16	1/4	15/16	1 13/16	1,400
1	7/16	1/4	1 1/16	1 15/16	1,200
1 1/8	7/16	3/8	1 3/16	2 1/16	800
1 1/4	7/16	3/8	1 5/16	2 3/16	700
1 3/8	1/2	7/16	1 7/16	2 7/16	500
1 1/2	1/2	7/16	1 9/16	2 9/16	500
1 5/8	17/32	15/32	1 11/16	2 3/4	450
1 3/4	17/32	15/32	1 13/16	2 7/8	400
1 7/8	9/16	1/2	1 15/16	3 5/64	350
2	9/16	1/2	2 1/16	3 3/16	300

EATON MANUFACTURING COMPANY

RELIANCE DIVISION **MASSILLON, OHIO**

Sales Offices: New York • Cleveland • Detroit • Chicago • St. Louis • San Francisco • Montreal


Over the Top!
Hollow
Flexible
Staybolts


RAILROADS HAVE SUCCESSFULLY MET EVERY CHALLENGE
Most of the Locomotives going "Over the Top" on the Transportation Front are equipped with Hollow Flexible Staybolts
FLANNERY BOLT COMPANY
BRIDGEVILLE
PENNSYLVANIA

800,000 Miles *"Without delays"*!

IN three years of grueling wartime service, Seaboard Air Line's big Diesel Locomotive "3016" has rolled up the proud record of 800,000 miles "without delays."

Over that period "3016" has flashed hundreds of times between Florida and points North hauling the famous "Silver Meteor" and other fine Seaboard trains.

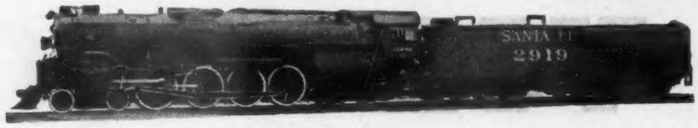
"Without delays" means notable maintenance efficiency . . . and adequate lubrication. Seaboard uses SINCLAIR GASCON GL-CC Diesel Oil for lubrication of "Number 3016" and other passenger, freight and switcher Diesels.

Sinclair Gascon gives cool engine operation with absence of deposits that cause ring sticking and carbon troubles. Its wear-prevention qualities hold down time-out for overhauls and maintenance costs.

May our Engineers tell you more about the advantages of using Sinclair Lubrication?

SINCLAIR RAILROAD LUBRICANTS

SINCLAIR REFINING COMPANY, *RAILWAY SALES*, NEW YORK • CHICAGO • SAINT LOUIS • HOUSTON

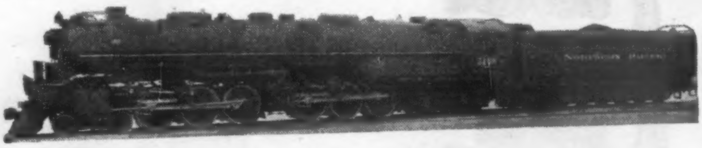


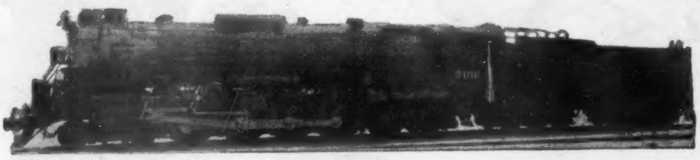
Atchison, Topeka and Santa Fe No. 2919
Built by Baldwin Locomotive Works in 1944

Detroit, Toledo and Ironton No. 808
Built by Lima Locomotive Works in 1944

Chesapeake and Ohio No. 1625
Built by Lima Locomotive Works in 1944

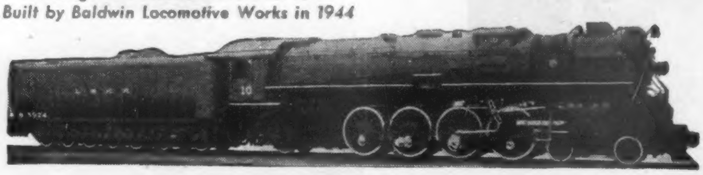
Northern Pacific No. 5148
Built by American Locomotive Company in 1944





Chicago, Rock Island and Pacific No. 5100
Built by American Locomotive Company in 1944

Lehigh and Hudson River No. 10
Built by Baldwin Locomotive Works in 1944



In Feedwater Heating

WORTHINGTON'S 8 PLUSES ADD UP TO 90% APPLICATIONS

- + 12% fuel saving
- + 13% increase in boiler capacity
- + 14% water saving
- + Increased draw-bar power
- + Fewer stops for water and fuel
- + Less boiler maintenance
- + Removal of 80% to 90% of corrosive oxygen from feedwater
- + Reduction of boiler scale accumulation

Superiorities like these account for the overwhelming choice in favor of Worthington's OPEN TYPE Feedwater Heaters. 90% of all recent orders for locomotives, including the orders for the six pictured on this page, specified Worthington.

For descriptive literature and data on power saving results in new as well as modernized locomotives, write today to — *Worthington Pump and Machinery Corporation, Harrison, New Jersey.*

WORTH BEHIND THE NAME
WORTHINGTON

LJ44-7

OPEN TYPE LOCOMOTIVE FEEDWATER HEATERS

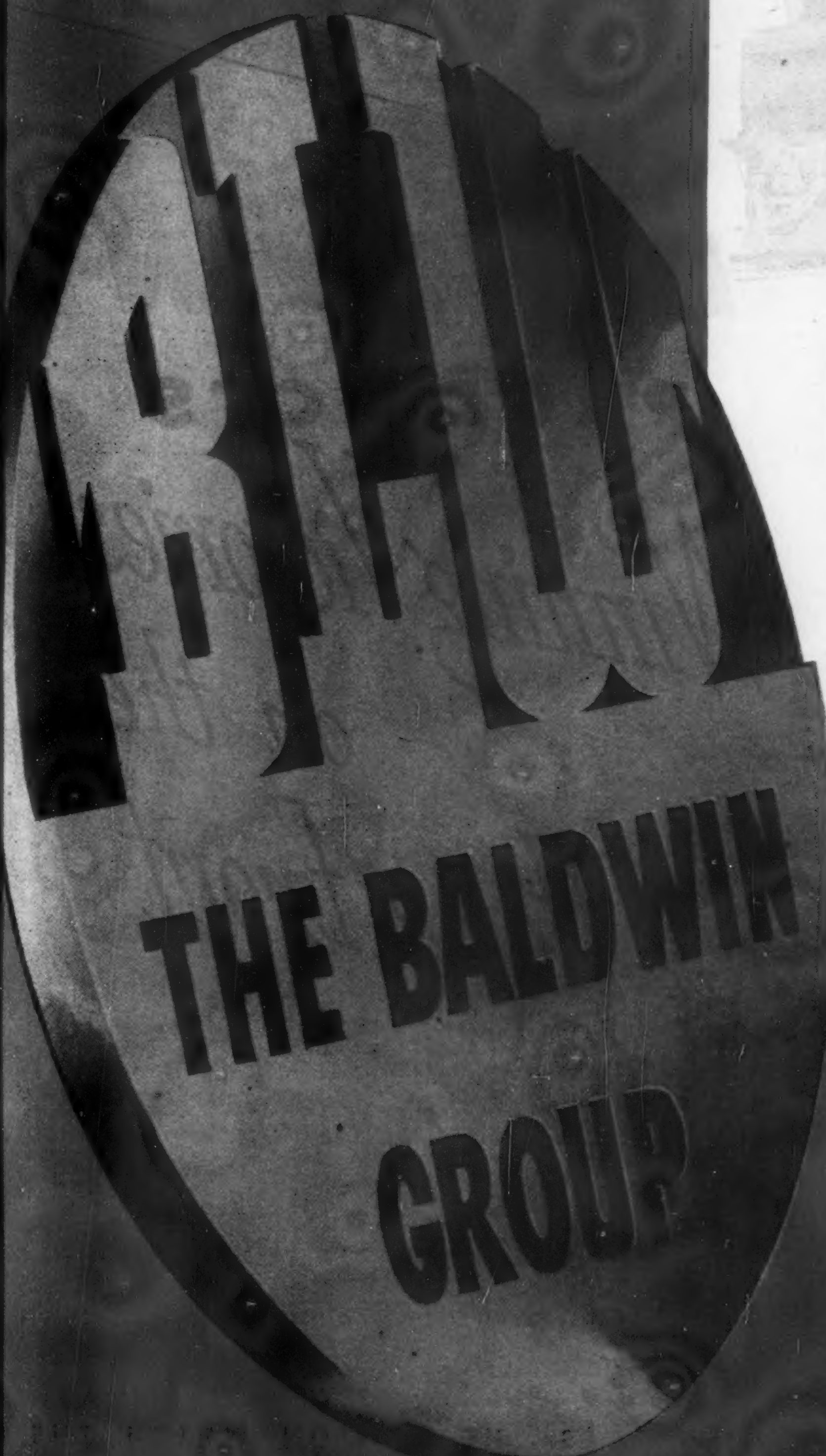
BALDWIN

The name *Baldwin* means locomotives in almost every country in the world, because Baldwin has been continuously active in this field since 1831 when America had less than 250 miles of railroads.

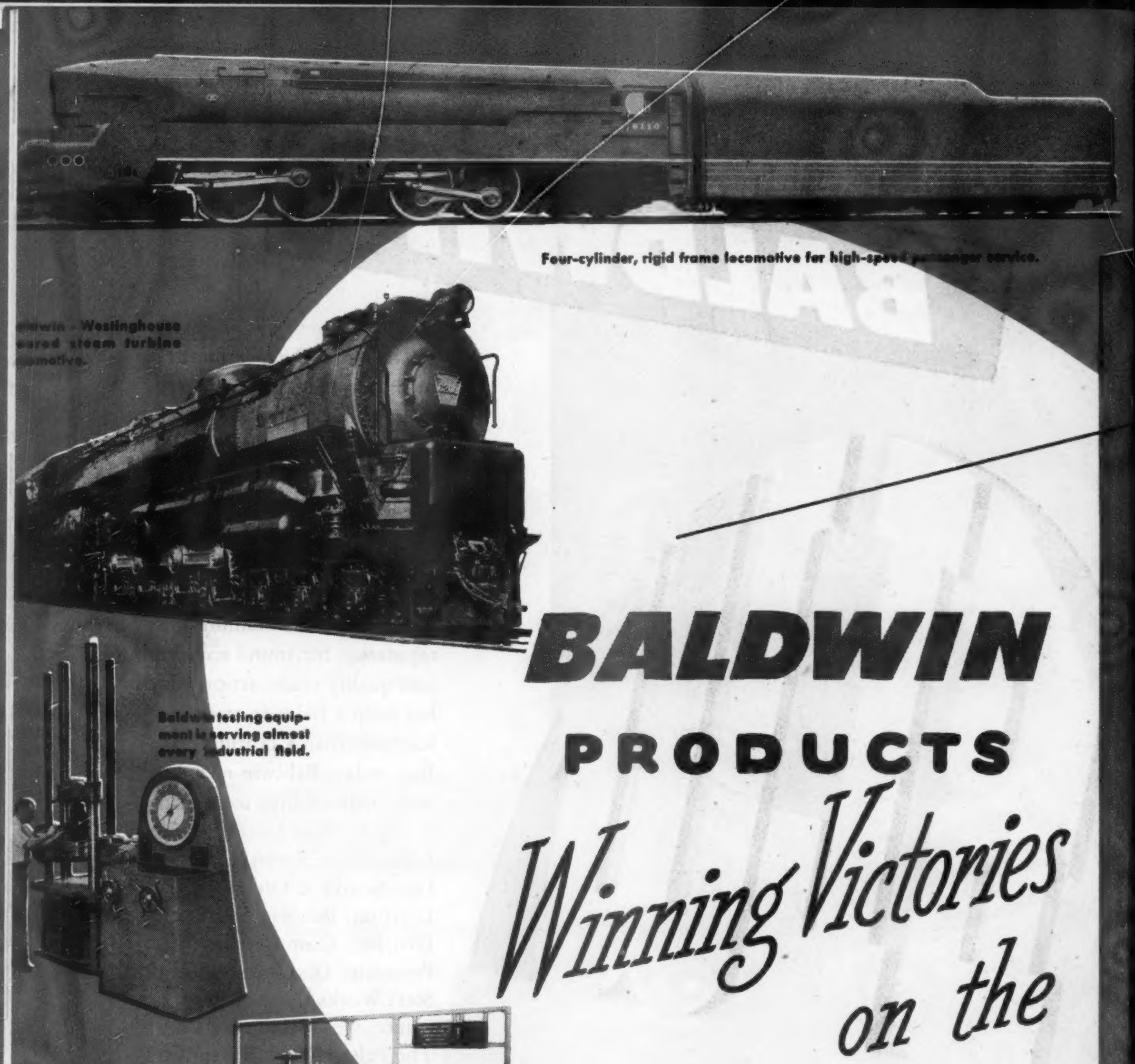
Modern Baldwin locomotives—steam, diesel-electric and electric—are maintaining the reputation for sound engineering and quality construction which has been a Baldwin tradition for more than a century.

But, today, Baldwin means many other things to industry—

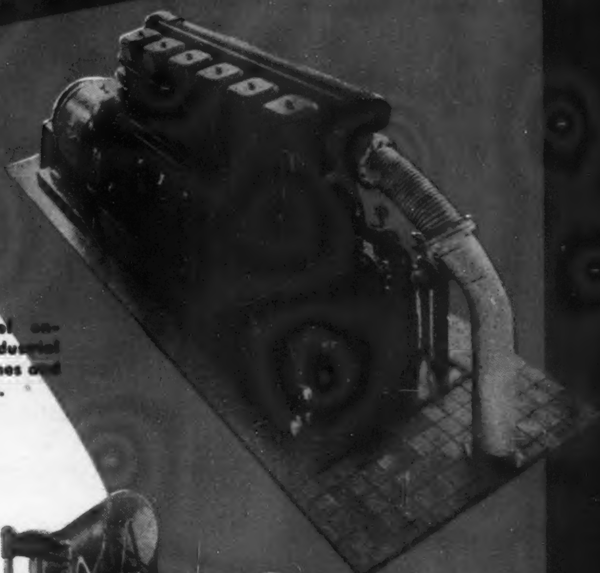
The Baldwin Locomotive Works, Philadelphia, Pennsylvania: Locomotive & Ordnance Division; Baldwin Southwark Division; Cramp Brass & Iron Foundries Division; Standard Steel Works Division; The Whitcomb Locomotive Co.; The Pelton Water Wheel Co.; The Midvale Co.



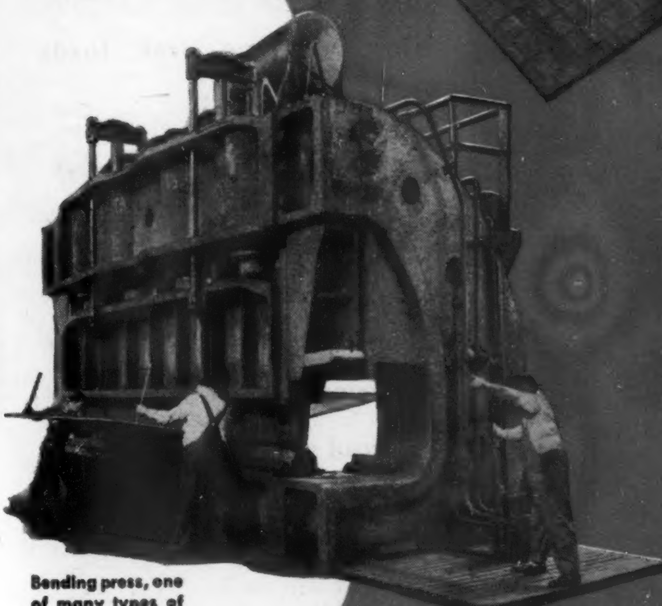
see next page


Four-cylinder, rigid frame locomotive for high-speed passenger service.
Westinghouse
steam turbine
Baldwin testing equipment is serving almost every industrial field.
car checks
scales for
and
SCALE TEST
790
BALDWIN
PRODUCTS
Winning Victories on the Home Front
Baldwin plate planer for railroad shops, shipyards, and other metal working industries.
BALDWIN SERVES THE NATION WHICH THE

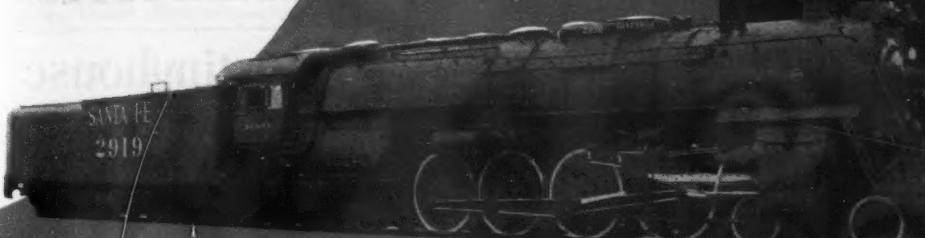
Articulated locomotive for heavy freight service.



Baldwin diesel engines for industrial power, pipe lines and marine service.



Bending press, one of many types of hydraulic presses built by Baldwin.



Heavy passenger locomotive of the 4-8-4 type.

THE RAILROADS HELPED TO BUILD

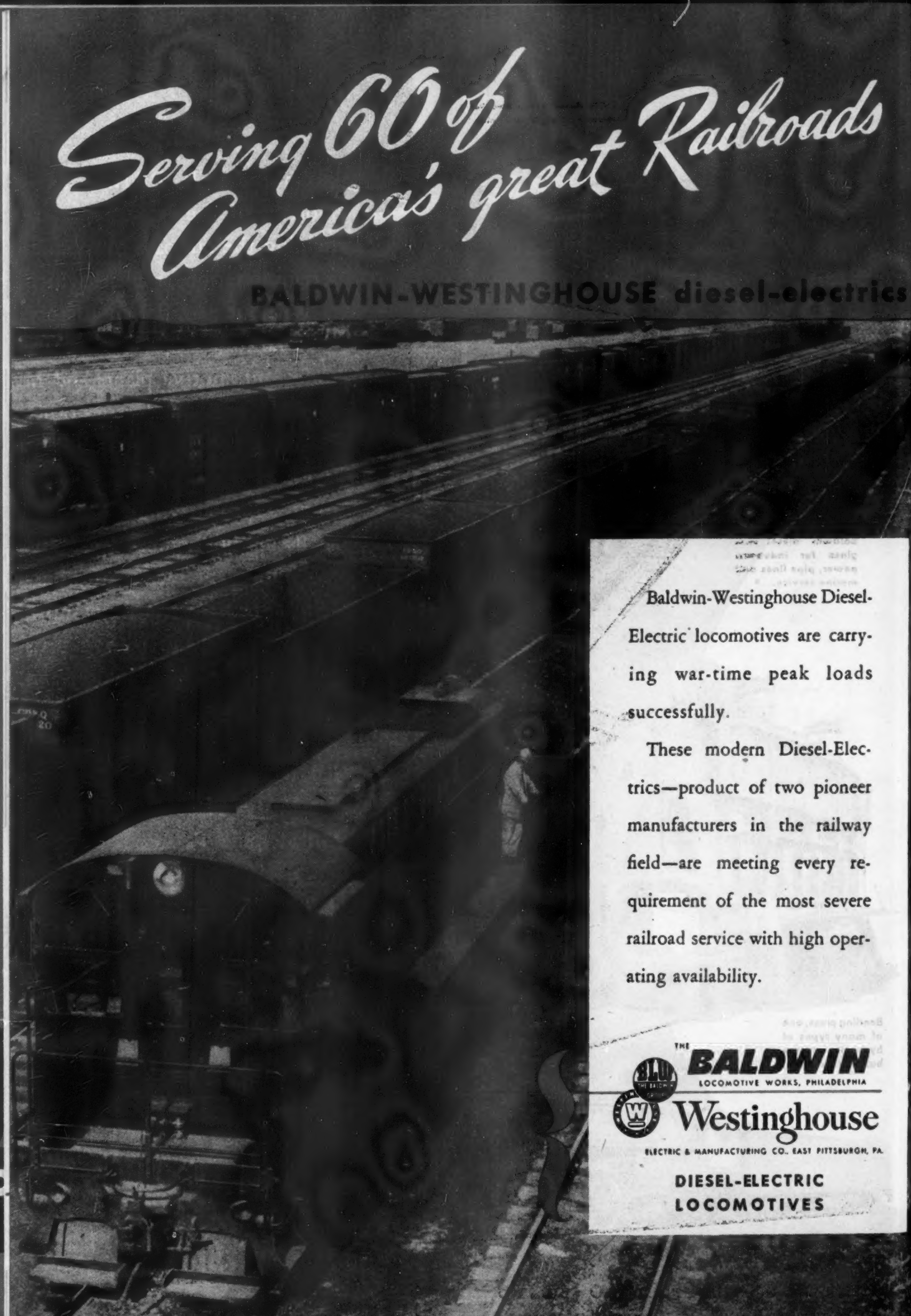
On the rails, Baldwin locomotives of the latest types are helping the railroads to conquer a transportation problem which is without parallel in history.

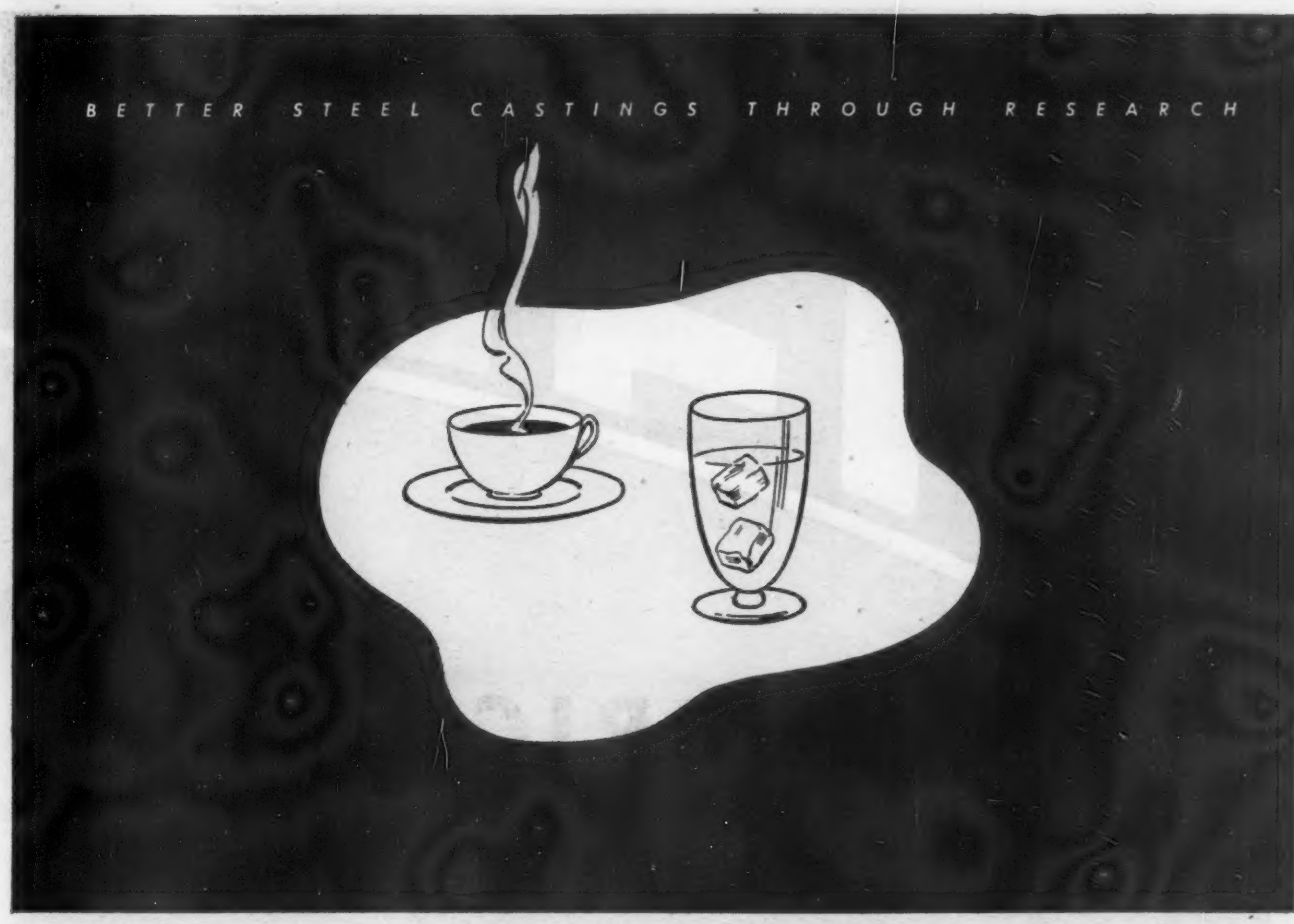
In railroad shops, aircraft factories, automotive plants and in dozens of similar industries, other Baldwin products are hard at work. Baldwin hydraulic presses form airplane wings, 105 mm shells and big bomber tires; testing equipment means safer pursuit planes and Victory ships; ship propellers and steering gears of all types serve the Navy and Merchant Marine. These are a few of the ways in which The Baldwin Group serves industry. The Baldwin Locomotive Works, Philadelphia, Pa.

BALDWIN

BALDWIN PRODUCTS: Steam, diesel-electric and electric locomotives, Diesel engines, Hydraulic presses, Hydraulic turbines, Ship propellers, Marine steering gears, Testing machines and instruments, Steel tires and rolled steel wheels, Steel forgings, Steel castings, Metal plate fabrication, Boilers, Non-ferrous castings, Bending rolls, Plate planers, Dynamometer cars.

BLW THE BALDWIN GROUP


Serving 60 of America's great Railroads
BALDWIN-WESTINGHOUSE diesel-electrics
Baldwin-Westinghouse Diesel-Electric locomotives are carrying war-time peak loads successfully.
These modern Diesel-Electrics—product of two pioneer manufacturers in the railway field—are meeting every requirement of the most severe railroad service with high operating availability.
THE BALDWIN LOCOMOTIVE WORKS, PHILADELPHIA
Westinghouse
ELECTRIC & MANUFACTURING CO., EAST PITTSBURGH, PA.
DIESEL-ELECTRIC LOCOMOTIVES



Vaccinated against Fever and Chills

Airplanes can now fly seven or eight miles above the earth, where thermometers register 60 to 70° below zero.

Steam turbines run at 1200°—hot enough to turn hard steel cherry red.

The steel castings that are component parts of the engines that work under these extremes, and over the wide range in-between, are conditioned for their jobs by scientific metallurgy and by heat treatment.

We start with alloys that have a certain amount of natural ability to endure very high or very low temperatures, or alloys that have any other combination of properties called for by the job.

And then these properties are enhanced by heat treating, which has developed into a very exact science.

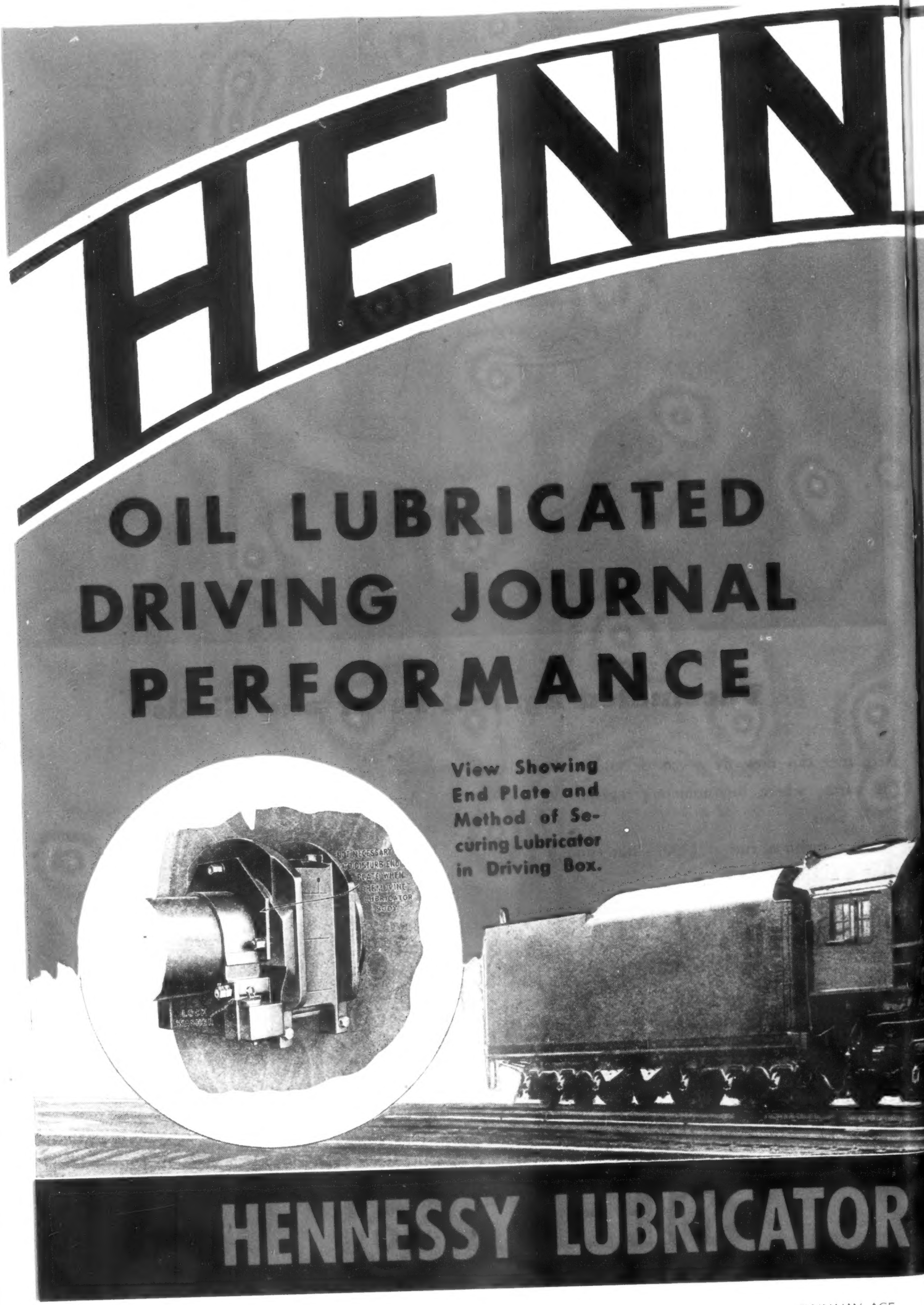
Research has given the steel founder a lot to work with. Tell him what conditions you want to meet, and he can provide steel castings with prescribed-in-advance mechanical properties.

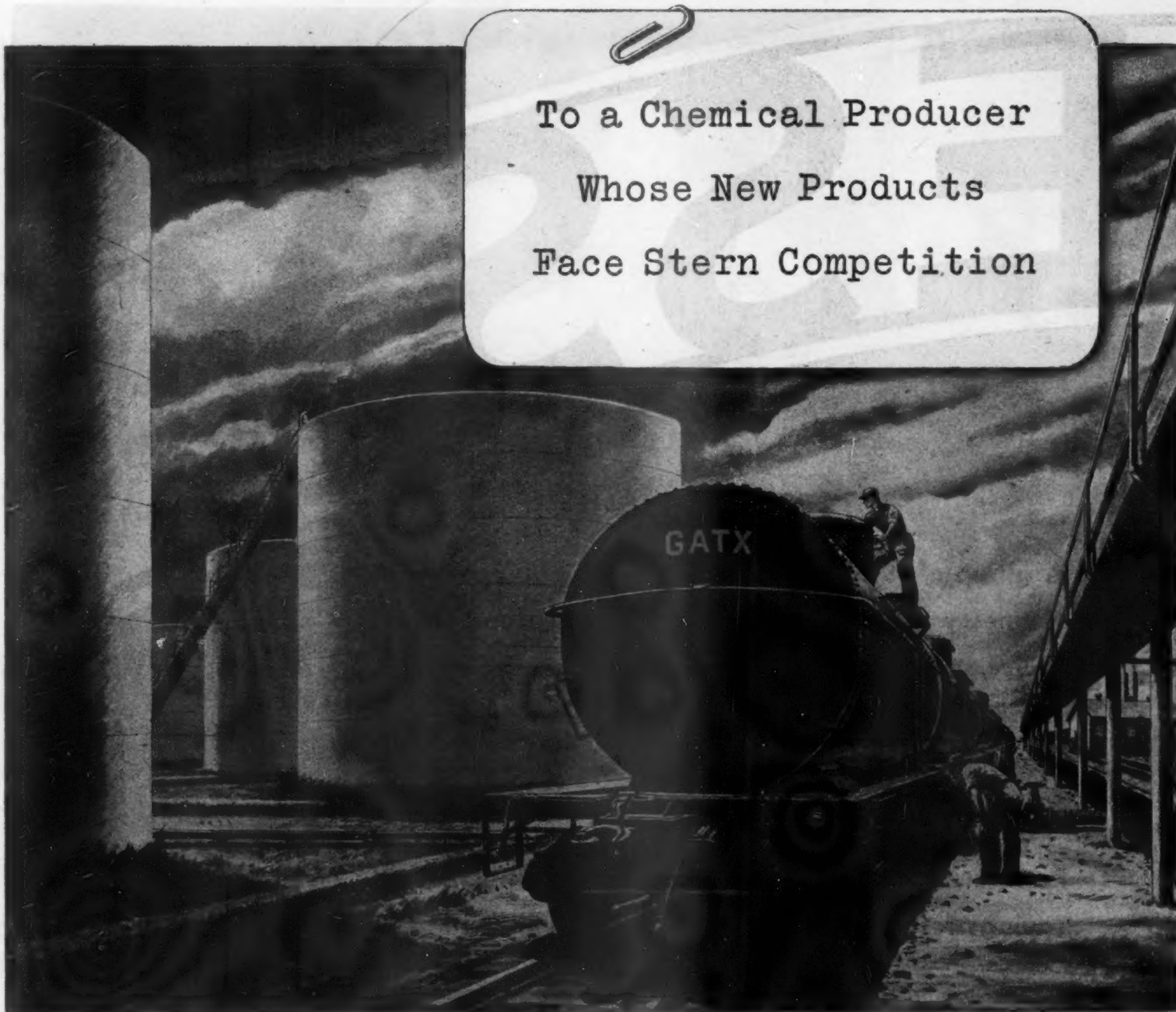
If you let your steel foundry work with you at the planning level, you can be sure of results—sure of satisfactory performance in the finished product.

Published by the Steel Founders' Society of America, to tell you about its organized Research Program.

MODERNIZE AND IMPROVE YOUR PRODUCT WITH

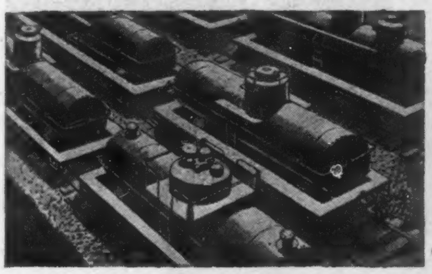
STEEL CASTINGS


HENN
OIL LUBRICATED
DRIVING JOURNAL
PERFORMANCE
View Showing
End Plate and
Method of Se-
curing Lubricator
in Driving Box.
HENNESSY LUBRICATOR

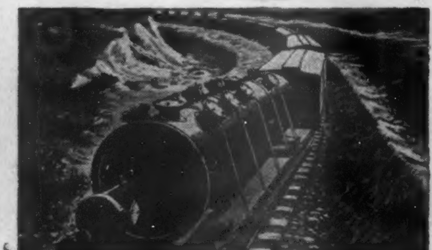


4 General American Services give you economies—in processing and shipping

Store your bulk liquids in General American's strategically located terminals. Without investment on your part, you get safe, fast handling and every safeguard against product contamination.



Hard-to-handle chemicals, perhaps never before transported in bulk, are carried at low cost in specialized General American tank cars, with scientific protective features.



Pressure vessels, barges, towers, and many other installations around the world are proving the skill of General American in designing, building, and erecting plate and welded equipment.

You can plan, with General American research engineers, process equipment that will cut costs, guard your quality standards, and convert waste material into profitable by-products.

Planning NOW with Tomorrow's Industrial Leaders

GENERAL AMERICAN TRANSPORTATION

CORPORATION

Chicago

GATX GENERAL AMERICAN

Builders and Operators of Specialized Railroad Freight Cars • Bulk Liquid Storage Terminals • Process Equipment of All Kinds • Pressure Vessels and Other Welded Equipment • Aerocoach Motor Coaches • Precooling Service for Fruits and Vegetables

for Higher Speeds Heavier Tonnage Trains

IN making your plans for 1945 and the Post-War Era ahead, bear in mind that the faster and more intensive operating freight practices of the future will require a thoroughly synchronized and wholly effective brake.

That's exactly why the "AB" Brake was developed. As more cars are "AB" equipped, the greater the certainty for continued progress in speed, safety and economy of freight train operation.

Positive, rapid and effective, it has many advanced features including calibration for better slack control. Doubly protected against dirt and easily accessible for cleaning and inspection, the "AB" Brake requires less frequent attention and saves on maintenance costs.

The New York Air Brake Company

420 Lexington Ave., New York City. Plant: Watertown, New York

HOW YOU CAN USE OFF-TRACK *TOURNAPULLS*

ON MAJOR RAILROAD MAINTENANCE PROJECTS . . .

Seven Tournapulls were used on this major maintenance project on the C. B. & Q. lines . . . difficult ground conditions won't stop these versatile, rubber-tired rigs.

Rubber-tired earthmovers help protect and widen banks and slopes on east-bound main line of C. B. & Q. without interrupting traffic . . . make 50 to 60 minutes of every work hour productive

For fast, low-cost handling of the C. B. & Q.'s major maintenance project on a nine-mile stretch between Chariton and Lucas, Iowa, Marsch-Peterson Co. of Chicago, Illinois and Omaha, Nebraska, used seven off-track, rubber-tired Tournapulls. These versatile units not only handled the earthmoving necessary to protect and widen banks and slopes, but also dug and cleaned out drainage ditches along the right-of-way.

Tournapulls Operate Under Difficult Conditions

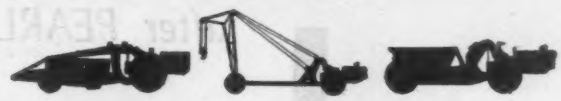
Operating under difficult ground conditions in saturated gumbo with heavy blue clay underneath, the Marsch-Peterson Tournapulls moved over 900,000 yards of dirt . . . hauled it about one-half mile along the road-bed, crossed the main line track, and wasted the material over an embankment on the other side . . . all without any interruption to vital wartime transportation.

As this C. B. & Q. project demonstrates, you can save on equipment investment and manpower with Tournapulls. One-man operated, they load, haul and spread in one continuous cycle. You need no costly, one-purpose loading units . . . no extra spur tracks or continual switching . . . no big crews. 50 to 60 minutes of every working hour is spent actually working.

What's more the same prime mover is quickly and easily interchanged for lifting and carrying with large-capacity Tournacranes, and for hauling with Tournatrailer.

Many Uses for Interchangeable Rigs

Here are just a few uses for your Tournapulls, Tournacranes and Tournatrailers:



New grade construction
Curve relocation and grade reduction
Widen banks and slopes
Dig, widen and deepen drainage ditches
Grade for new sidings, spur and passing tracks
Remove slides, fill-in and repair washouts
Coal handling and stockpiling
Moving and shifting tracks
Transporting and placing bridge members, drainage structures, etc.
Clearing tracks of wreckage in emergencies
Loading and unloading work train supplies and freight cars
Lifting, moving and stacking ties, timbers and rails in supply yards

FREE Magazine Features Railroad Jobs

How other alert railroads cut costs with LeTourneau equipment is told and pictured in the November issue of the LeTourneau CO-OPERATOR magazine. Fill in the coupon below and mail it TODAY for your FREE copy of this 16-page, illustrated magazine.

R. G. LeTourneau, Inc., Dept. RA-145, Peoria, Ill.
Please send me the November issue of the CO-OPERATOR, which features railroad jobs—also place my name on your mailing list to receive this 16-page earthmovers magazine ten times yearly.

NAME__________

TITLE__________

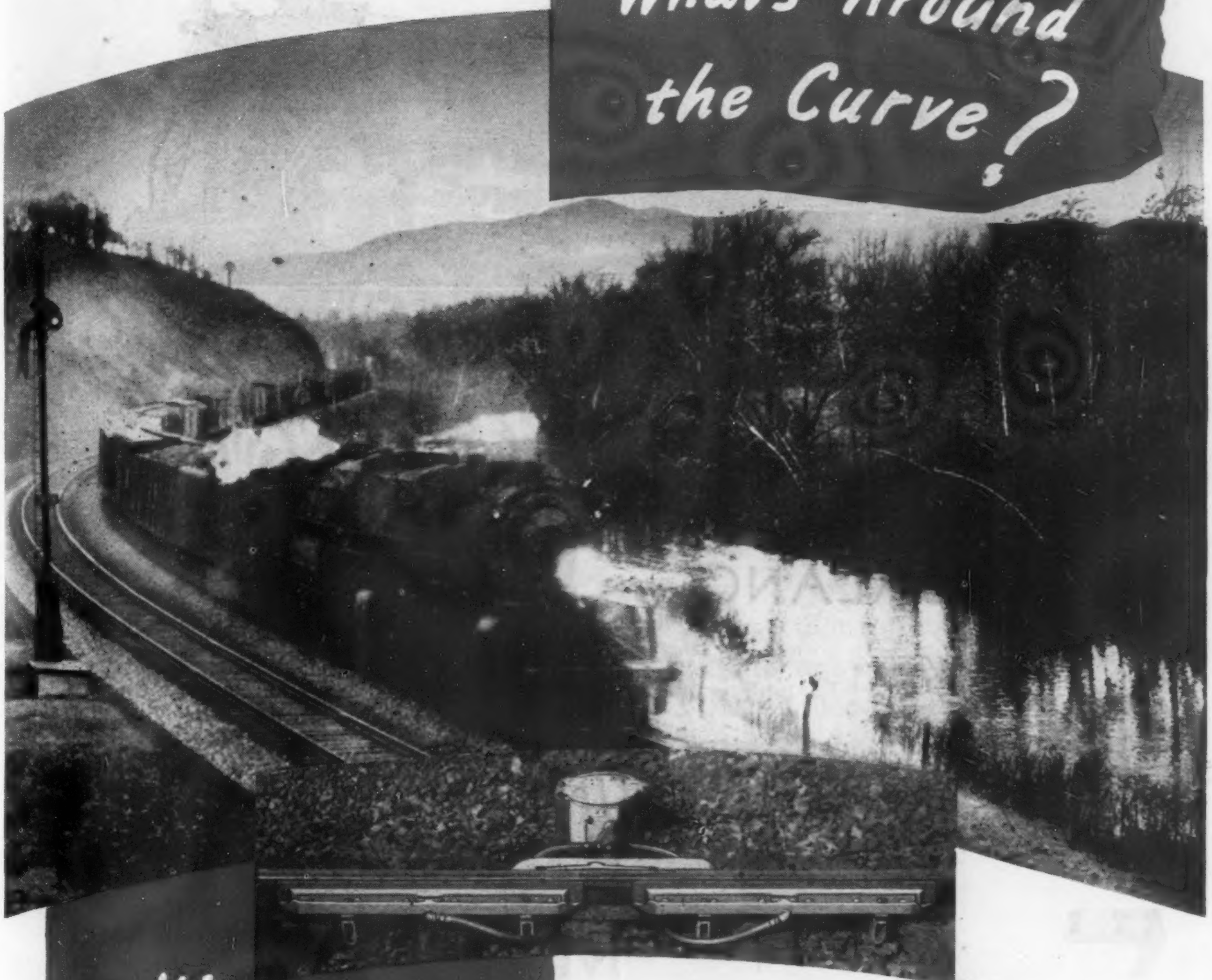
DEPT__________

COMPANY__________

ADDRESS__________

LETOURNEAU
PEORIA, ILLINOIS • STOCKTON, CALIFORNIA

What's Around the Curve?

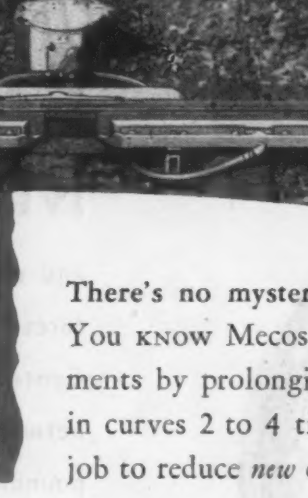


it's MecoLubrication—
and it's all around the Curve!

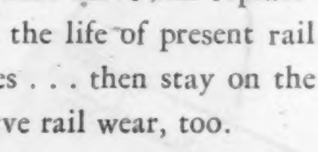
Each MECO Lubricator Protects a Number of Curves

There's no mystery about MecoLubrication! You KNOW Mecos reduce curve rail replacements by prolonging the life of present rail in curves 2 to 4 times . . . then stay on the job to reduce *new* curve rail wear, too.

Maintenance Equipment Company
RAILWAY EXCHANGE BUILDING • CHICAGO, ILLINOIS



Power Rail Layer Requires No Train Orders



Mack Reversible Switch Point Protectors Make switch rails last 8 to 10 times longer

GREATER STRENGTH BETTER BALANCE

WITH

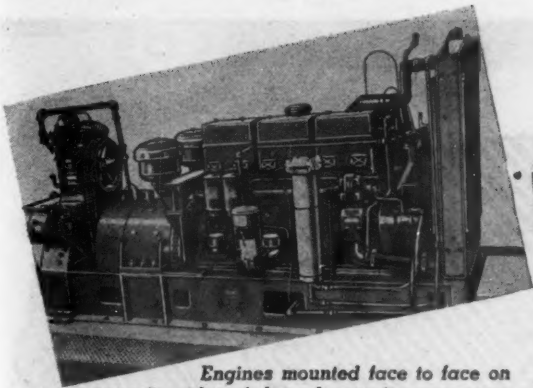
UNIVERSAL DRIVING WHEEL CENTERS

LFM alloy steel pistons are 50 per cent lighter than the conventional type. Used together with LFM Universal sectional bull and packing rings, they assure big savings in locomotive operations.

MAXIMUM strength in all directions, greater resistance to radial, transverse and compressive stress are outstanding features of LFM Universal Driving Wheel Centers. Absence of crowning or flattening between spokes eliminates the resultant pounding so destructive to track and equipment. Their scientific design, too, permits easier and more effective balancing.

THE LOCOMOTIVE FINISHED MATERIAL CO.

ATCHISON, KANSAS ★ NEW YORK CITY ★ CHICAGO, ILL.



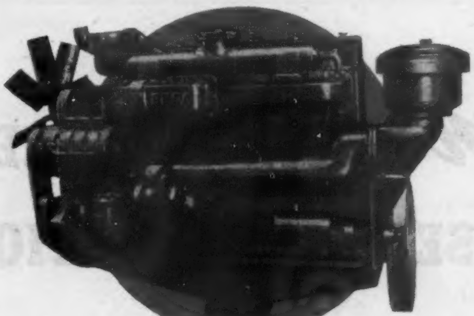
Engines mounted face to face on opposite sides of the cab permit easy accessibility for inspection and maintenance.

BUDA powered means . . .

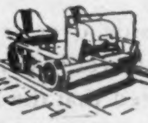
More Net Income

Because of availability—fast acceleration—high tractive effort—low fuel costs and minor maintenance requirements, sturdy BUDA powered Diesel locomotives are getting more work done in terminals, freight centers and busy yards in less time and at lower costs, resulting in more net income.

The smooth, versatile power of BUDA Diesels, designed to meet rugged railroad requirements, are not only proving to be a match for the challenge of today's tremendous railroad problems, but are doing the job quicker and more efficiently. Write or wire for detailed information.

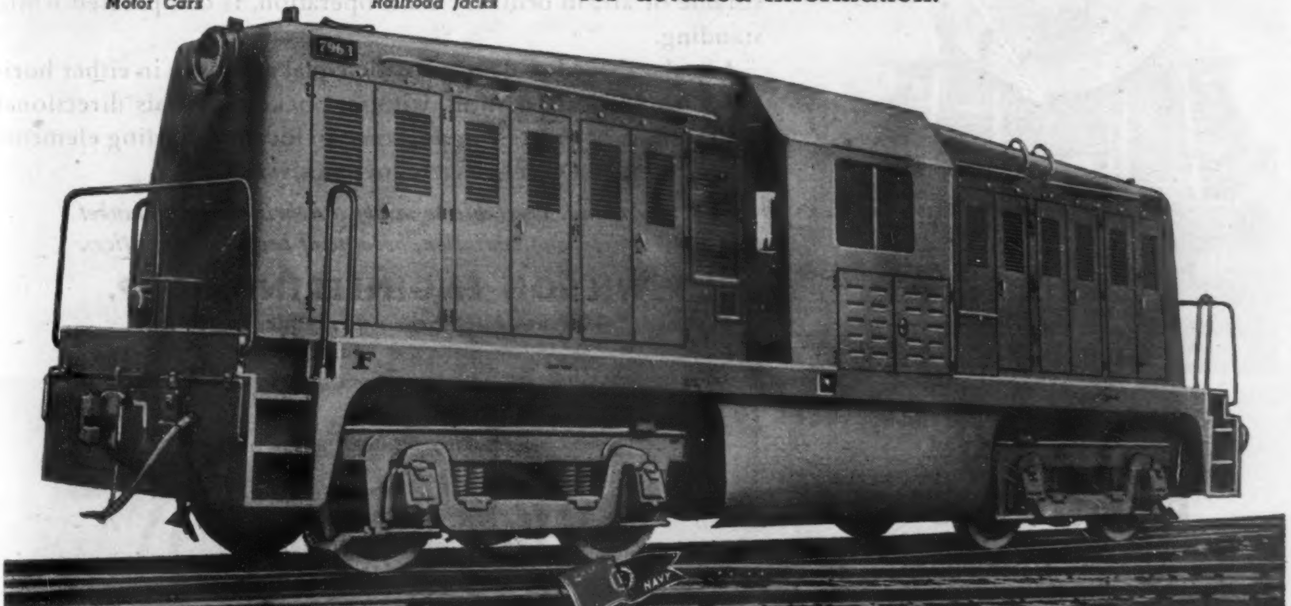


BUDA model 6-DCS-1879 Supercharged Diesel used in above Whitcomb locomotive.



Motor Cars

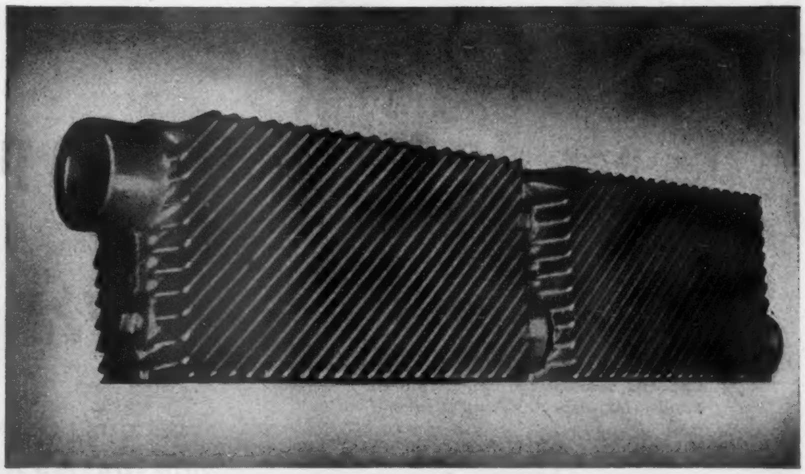
Railroad Jacks

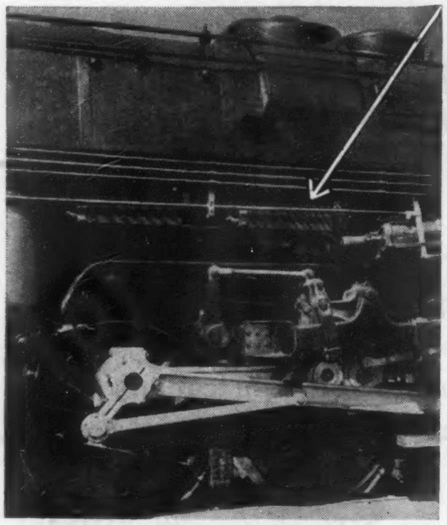


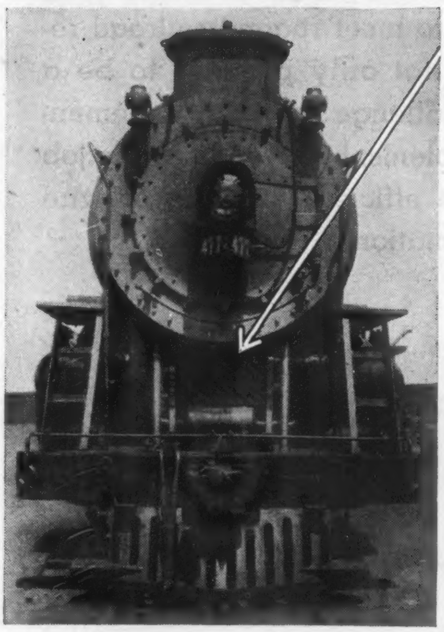
BUDA

15401 Commercial Avenue
Harvey (Chicago Suburb) **Illinois**

Wilson All-cast Elements, tested to 500 pounds per square inch before shipment. (For all heat exchange purposes)







Wilson ALL-CAST, FINNED COMPRESSED AIR RADIATION

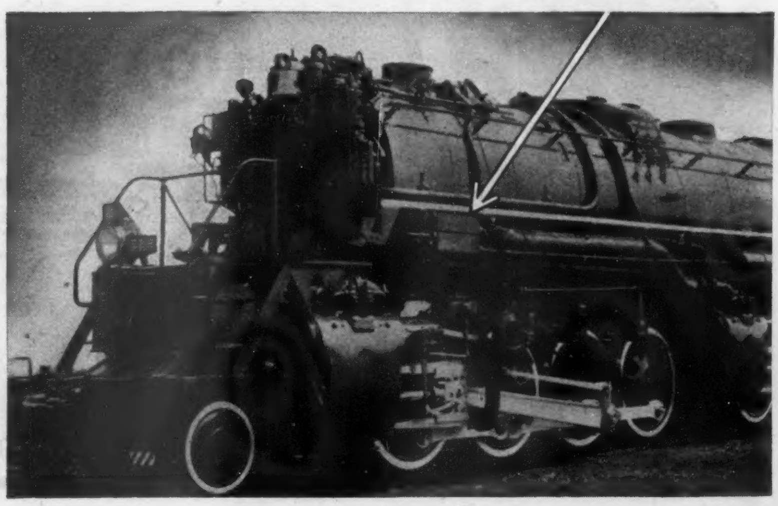
Wilson Radiation comprises compact all-cast elements, available for primary, intermediate, or final, locomotive compressed air cooling.

It may be located at front end, right or left side, over or under boiler, to suit convenience or preference. However in considering a front end location, it must be remembered that the largest volume of air, in ordinary train operation, is compressed while standing.

Angular directional fins provide equal efficiency in either horizontal or vertical position, without pocketing. This directional fin feature is of greatest importance in locating cooling elements in electric and Diesel-electric locomotives.

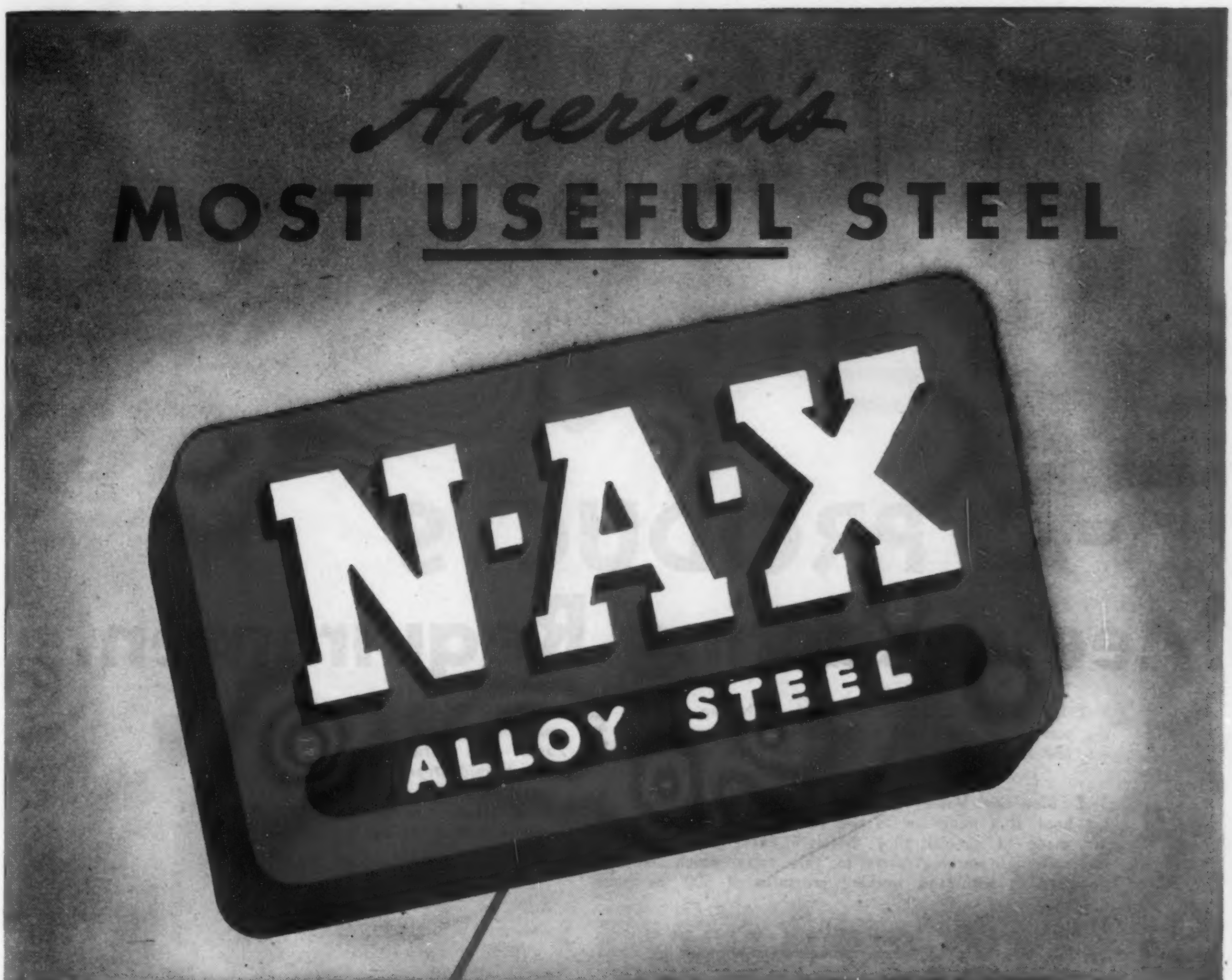
Animal, vegetable or mineral debris does not blanket this type of radiation, because of large fin interstices.

WILSON ENGINEERING CORP.
122 So. Michigan Ave., Chicago 3, Ill.



WILSON PRODUCTS

Unit Heaters
Blow-off Cocks
Mufflers or Separators
Feed Water Heaters
Compressed Air Radiation
Bake Oven Heat Radiation

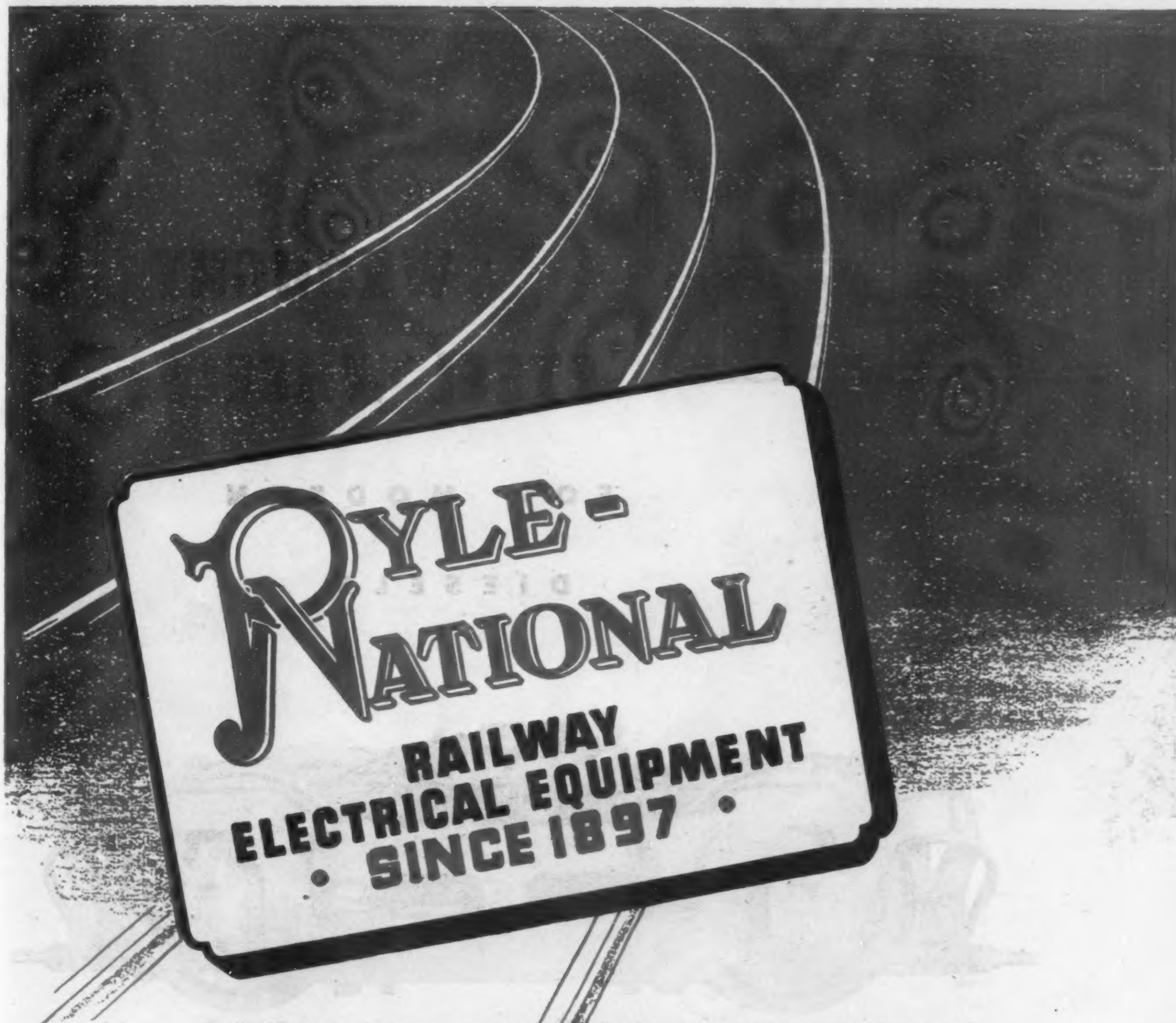


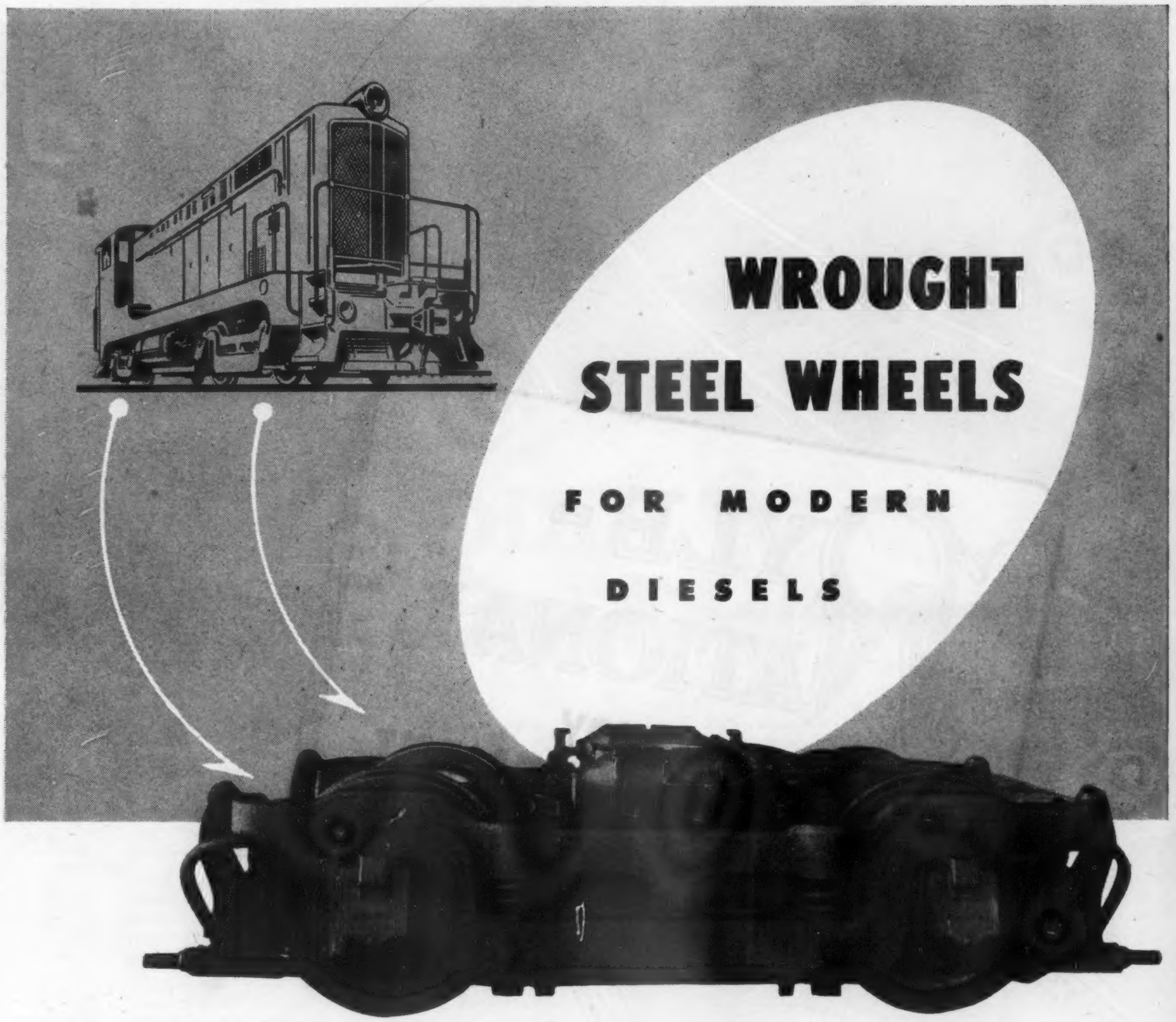
A low-alloy steel with an extremely wide range of applications, produced in *high-tensile* grades and in *carburizing* and *constructional* grades. Vastly stronger and tougher than carbon steels—more economical and more easily fabricated than high-alloy steels. Tomorrow's great products, like today's great fighting equipment, will be made of N-A-X alloy steel.

GREAT LAKES STEEL
Corporation

DETROIT 18, MICHIGAN • SALES OFFICES IN PRINCIPAL CITIES
Division of NATIONAL STEEL CORPORATION • Executive Offices, Pittsburgh, Pa.

N-A-X ALLOY STEEL IS USED IN: amphibian tanks . . . tanks and tank destroyers . . . jeeps, trucks and personnel cars . . . tractors, tank retrievers and other heavy equipment . . . fighter and bomber aircraft of all types . . . Navy ships, from PTs to battleships . . . gun mounts and carriages . . . landing craft . . . miscellaneous weapons and equipment.


PYLE-NATIONAL
RAILWAY
ELECTRICAL EQUIPMENT
SINCE 1897



Wrought steel wheels by Standard, have been demonstrating their quality and over-all economy on steam engine trucks, tender trucks and car trucks for almost forty years.

The constantly increasing severity of service demands has resulted in improvements in the quality of the Wrought Steel Wheel in which Standard Steel Works Division was a pioneer.

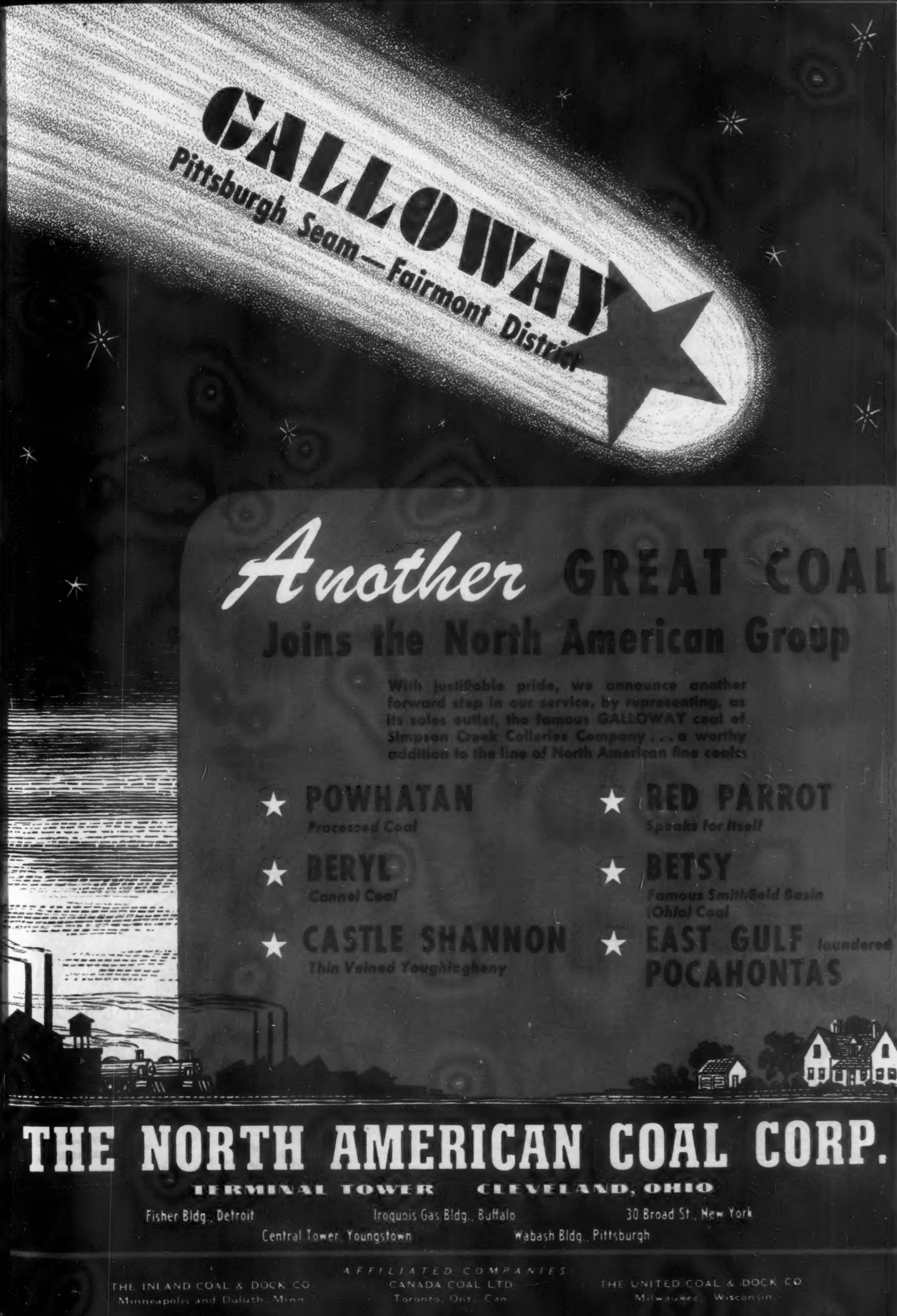
The advent of the diesel-electric locomotive has opened a new field which is taking full advantage of the toughness and long wear of wrought steel wheels.

All Baldwin-Westinghouse diesel-electric locomotives are equipped with Standard wheels. *The Baldwin Locomotive Works, Standard Steel Works Division, Burnham, Penna. Offices: Philadelphia, New York, Washington, Boston, Cleveland, San Francisco, St. Louis, Chicago, Houston, Pittsburgh.*

BLW THE BALDWIN GROUP

BALDWIN

STEEL FORGINGS & CASTINGS


GALLOWAY
Pittsburgh Seam—Fairmont District
Another GREAT COAL
Joins the North American Group
With justifiable pride, we announce another forward step in our service, by representing, as its sales outlet, the famous GALLOWAY coal of Simpson Creek Collieries Company . . . a worthy addition to the line of North American fine coals:
★ POWHATAN
Processed Coal
★ RED PARROT
Speaks for Itself
★ BERYL
Cannel Coal
★ BETSY
Famous Smithfield Basin (Ohio) Coal
★ CASTLE SHANNON
Thin Veined Youghiogheny
★ EAST GULF laundered POCAHONTAS
THE NORTH AMERICAN COAL CORP.
TERMINAL TOWER CLEVELAND, OHIO
Fisher Bldg., Detroit
Iroquois Gas Bldg., Buffalo
30 Broad St., New York
Central Tower, Youngstown
Wabash Bldg., Pittsburgh
AFFILIATED COMPANIES
THE INLAND COAL & DOCK CO.
Minneapolis and Duluth, Minn.
CANADA COAL LTD.
Toronto, Ont., Can.
THE UNITED COAL & DOCK CO.
Milwaukee, Wisconsin.

Timber With a College Degree

Wood has recently gone through a growing up and educating progress that makes it an amazingly versatile construction material for all sizes and types of buildings.

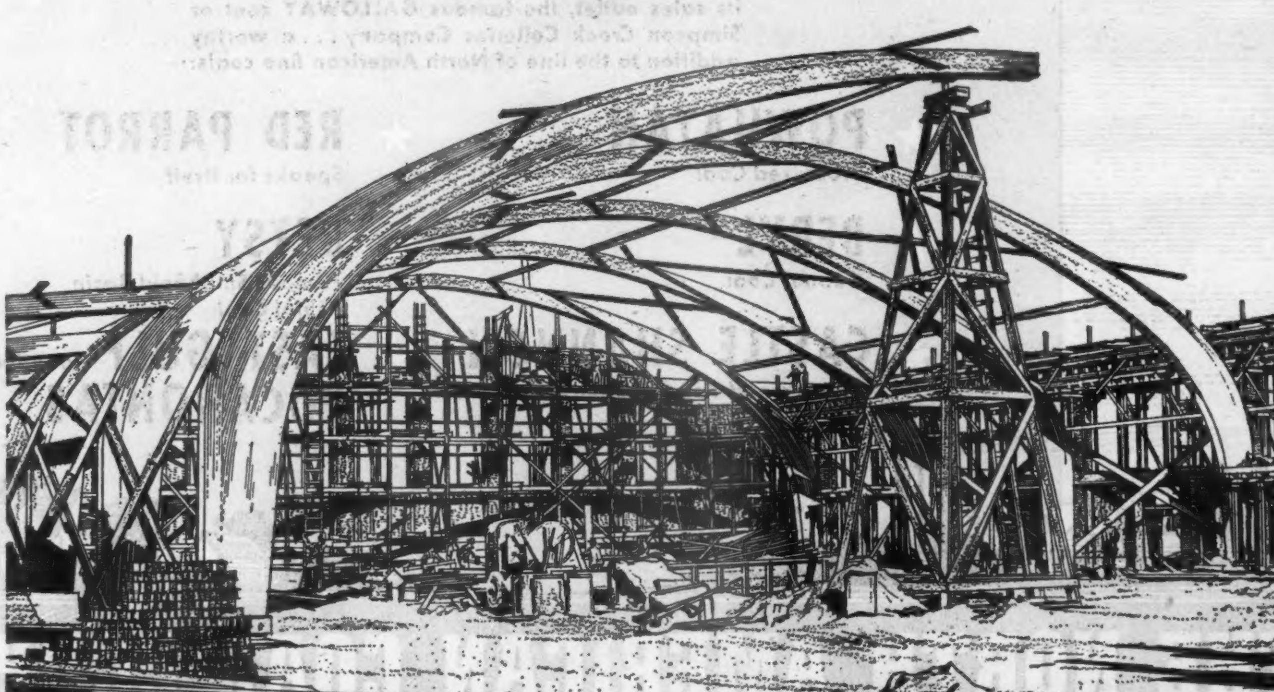
At no place in the entire building industry is the modernization of wood more apparent than in those structures where glued laminated timber arches and other members have been employed.

Timber Structures has pioneered in the development of glued laminated arches, trusses, beams, columns; oars and other products in the field of wood specialties.

Laminated members excite the interest of architects, engineers and contractors, because they possess unusual strength, eliminating manv supports and posts; they can be patterned to conform to engineering needs and to architectural design.

If you have plans for present or future construction work, we should like to talk to you about the availability, strength, permanence and economy of timber. Illustrated literature will be mailed gladly on request. We are prepared to serve you in timber and allied structural materials.

TIMBER STRUCTURES
INCORPORATED
Portland 8, Oregon
New York 17, N.Y.



GLUED LAMINATED ARCHES, 92' 4" span, prefabricated by Timber Structures, Inc. for Boeing Aircraft Company, Seattle, Wn. Pen drawing by Louis C. Rosenberg, internationally known etcher and renderer. A copy suitable for framing will be mailed free to architects and engineers on professional letterhead request.

DAVENPORT 44-TON AND 35-TON DIESEL SWITCHERS PAY FOR THEMSELVES IN A SHORT TIME BY ENDING THE WASTE OF OVER-POWER ON MANY LOCATIONS

Controllable Leaks are DOLLARS thrown away

DAVENPORT *Lighter* DIESEL SWITCHERS

are available in 44-Ton Diesel-Electric and 35-Ton Diesel-Mechanical

EXPORT OFFICE
BROWN & SITES
50 Church Street
NEW YORK
Cable Address
"BROSITES"

THE DIRECT SAVINGS achieved by Davenport Lighter Diesel Switchers were impressive before the war—have increased during the all-out years—and will assume added significance when the adjustment to Peace gets under way.

As cool executive judgments appraise the future of the American railroads, one sobering fact looms large to command attention. Competitive pressures will increase. Economies such as those realized from the employment of Davenport Lighter Diesel Switchers — on hundreds of locations now served by the heavier and more costly steamers, and larger Diesels—will contribute substantially to the overall soundness of rail operation.

Data pertaining to the stoppage of Leaks due to Over-Power will be sent to all inquiring railroad executives.

DAVENPORT LOCOMOTIVE WORKS
A DIVISION OF DAVENPORT BESLER CORPORATION
DAVENPORT, IOWA, U. S. A.

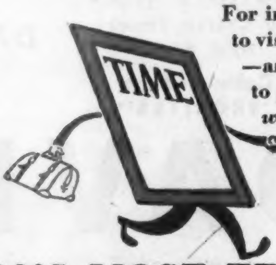
DAVENPORT

Pioneers of the Lighter Diesel Switchers

What about YOUR Post-War TRAVEL ADS?

TODAY travel advertisers are dreaming up advertisements like this one just to put their ideas for future travel-selling into writing—just to keep their eyes on the post-war ball.

When people can go places again, many such advertisements will again appear in TIME. For so many travel advertisers have found that TIME is the best way to reach America's most traveled million families that TIME has been the leader in Travel, Resort and Hotel Advertising for nine consecutive years (except for one year when it was second). *And* TIME *will be tops tomorrow, too.*



For instance—354,000 TIME families plan to visit a South American country some day—and 89,000 TIME-reading families plan to go *within the first five years after the war*, according to a recent survey.

THE WAY TO REACH AMERICA'S MOST TRAVELED MILLION

Hundreds of designers working on the interiors of vehicles of various sorts for the transportation of the public have come to the same conclusion —namely, that Formica decorative sheet offers greater beauty in combination with greater resistance to tough wear than any other material.

Thus before the war you found this material used for wall covering, table tops, window stools in the finest ships, the deluxe streamlined trains, terminals, as well as in busses and taxicabs. And after the war passenger airplanes and personal motor cars will be added.

The limpid plastic surface of Formica provides a thoroughly modern beauty in the widest range of attractive colors and patterns. The material is sanitary, non-absorbent, as easy to keep clean as glass—and by the same methods. It does not stain. For horizontal surfaces it may be cigarette-proof.

Installation is simple—right from the production point of view! Let our engineers give you all the facts.

The Formica Insulation Company
4641 SPRING GROVE AVENUE
CINCINNATI 32, OHIO

FORMICA

Why not

CUT COAL BILLS
EXPEDITE TRAINS

The HANNA System of Firing will do it

It will pay to investigate

HANNA STOKERS

THE HANNA STOKER COMPANY
Cincinnati 27, Ohio

KEEP YOUR EQUIPMENT CLEAN

WITH TIME-SAVING

OAKITE COACH-WASHING MATERIALS

Today's Best Answer for Fast, Low-Cost Cleaning of Coaches and Power Units

"KEEP POWER ROLLING"

Purchasing Agents and Storekeepers

can depend on Oakite materials always being of the same standard quality. Direct shipments on orders can be made over your own lines or from our factory or other points most convenient. Or, materials can be shipped from our warehouse stocks maintained in 35 key cities.

More and more roads are using Oakite materials because they provide one sure, successful answer to the problem of turning out essential maintenance work faster and easier and thus reducing out-of-service time. Let us serve your road in the same effective way!

Where help is short and time is limited specialized Oakite materials today are successfully providing the answer for leading roads that require quick, easy, safe ways to remove road grime, oil film and other deposits from coaches and power units.

Ask Us To Make Test On Your Road

A wide range of Oakite materials expressly designed for washing passenger coaches, steam and Diesel locomotives helps you do this work at low cost, and with safety to surfaces. If you have a problem keeping your equipment clean, the trained men of our Railroad Division will be glad to make tests and demonstrate the improved results that high quality Oakite materials provide.

OAKITE PRODUCTS, INC., WRIGLEY BUILDING, CHICAGO 11, ILL.
In Canada: OAKITE PRODUCTS OF CANADA, LTD.
TORONTO. 65 Front St. East—MONTREAL: 1 Van Horne Ave.

OAKITE
TRADE MARK REG. U.S. PAT. OFF.
RAILWAY SERVICE DIVISION

Investigate

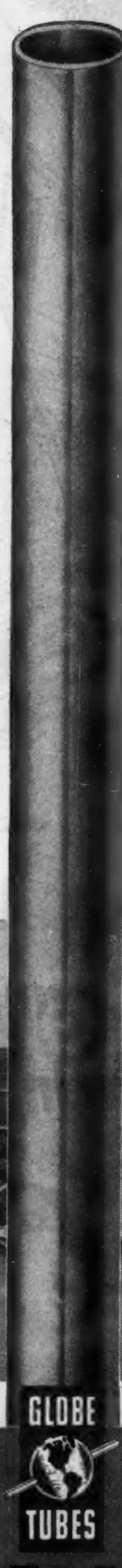
GLOBE ALLOY STEEL TUBES

. . . . FOR BUSHINGS ON LOCOMOTIVE MOVING PARTS

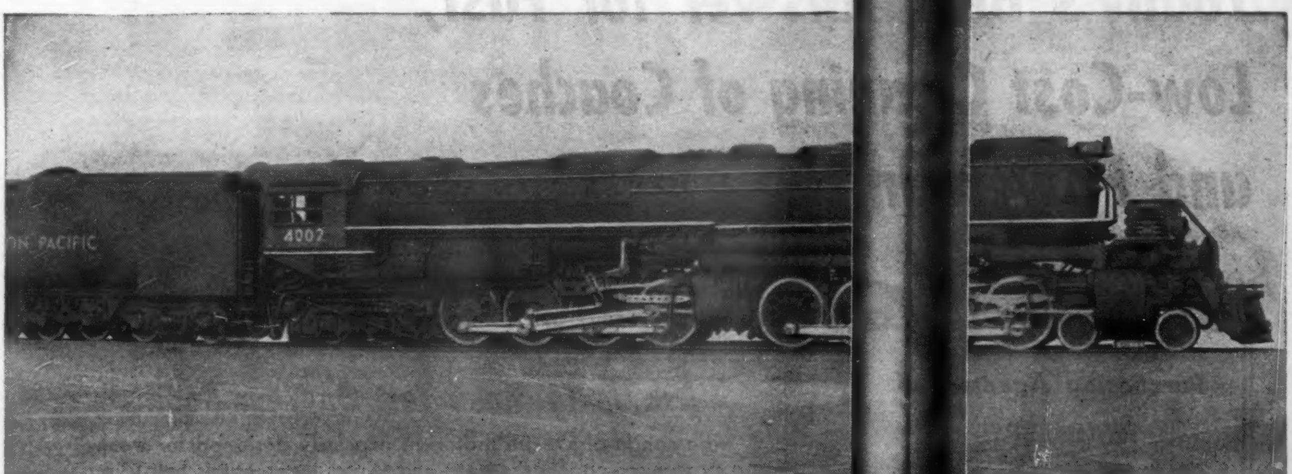
Available in sizes and wall thickness to meet a wide range of requirements, Globe Alloy Steel Tubes are an ideal material for bushings on locomotive moving parts.

Globe Alloy Steel Tubes offer maximum strength with minimum weight — long life — adaptability — and comparatively lower cost because they require so little machining. Globe engineers will be glad to assist you in selecting alloy steel tubes of the exact characteristics you require.

GLOBE STEEL TUBES CO.
MILWAUKEE, WISCONSIN



16-Driving Wheel Mountain-Type Locomotive of modern design, built for the Union Pacific by American Locomotive Company. Globe Boiler Tubes are used in many of these modern types of locomotives.



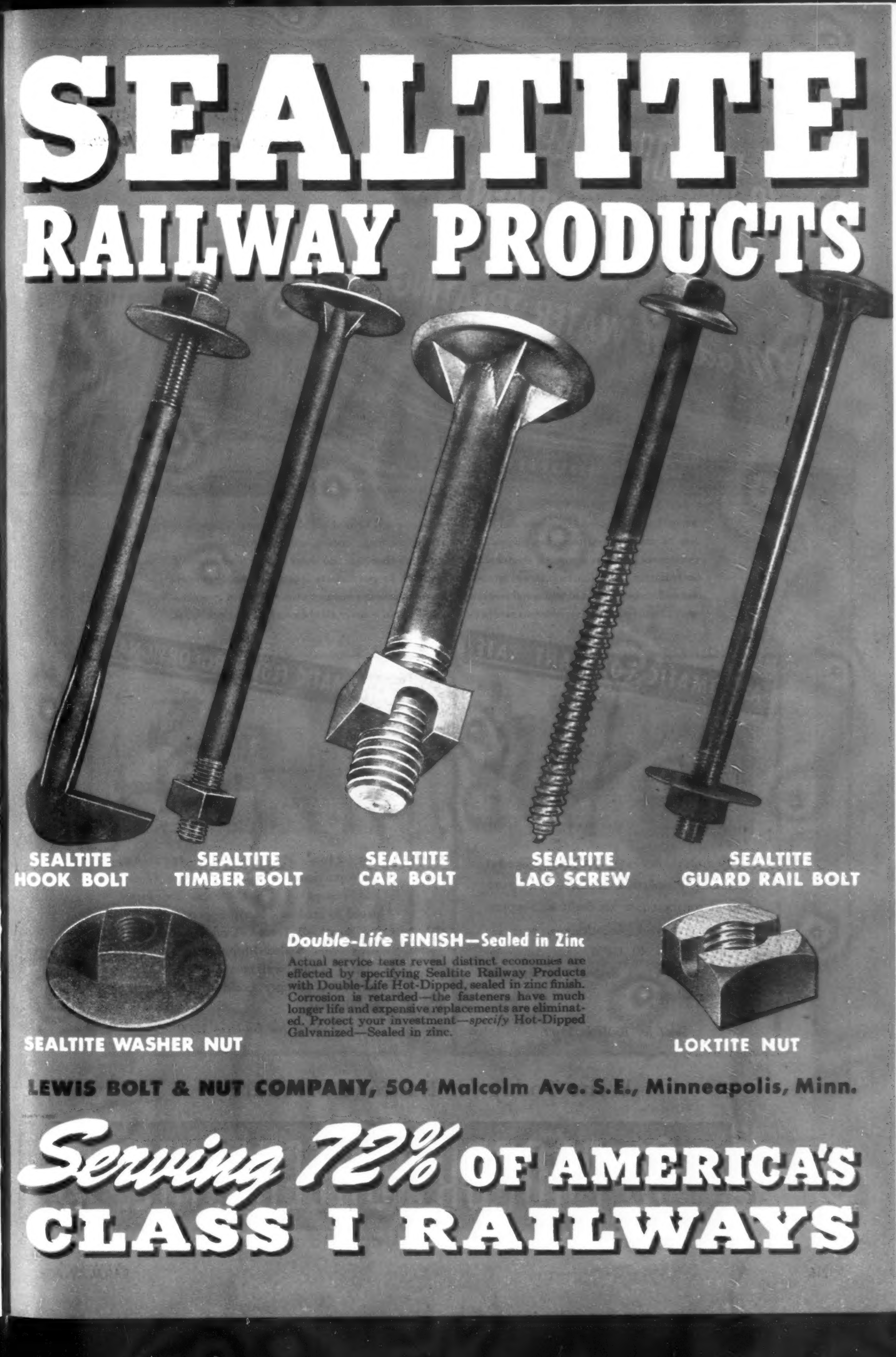
TUBES: Carbon — Alloy — Stainless Steel

- ★ Boiler and Pressure Tubes
- ★ Condenser and Heat Exchanger Tubes
- ★ Stainless Tubes (Seamless)
- ★ Mechanical Tubing
- ★ Gloweld Tubes (Welded Stainless)
- ★ Globeiron Tubes (Seamless Pure Iron)

GLOBE STEEL *Tubes*

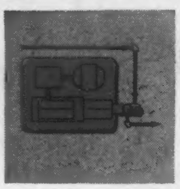
5005

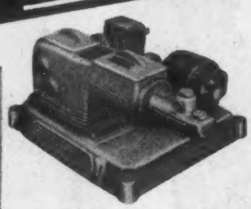
GLOBE STEEL TUBES CO., *Milwaukee, Wisconsin, U. S. A.*


SEALTITE
RAILWAY PRODUCTS
SEALTITE HOOK BOLT
SEALTITE TIMBER BOLT
SEALTITE CAR BOLT
SEALTITE LAG SCREW
SEALTITE GUARD RAIL BOLT
SEALTITE WASHER NUT
Double-Life FINISH—Sealed in Zinc
Actual service tests reveal distinct economies are effected by specifying Sealtite Railway Products with Double-Life Hot-Dipped, sealed in zinc finish. Corrosion is retarded—the fasteners have much longer life and expensive replacements are eliminated. Protect your investment—*specify* Hot-Dipped Galvanized—Sealed in zinc.
LOKTITE NUT
LEWIS BOLT & NUT COMPANY, 504 Malcolm Ave. S.E., Minneapolis, Minn.
Serving 72% OF AMERICA'S
CLASS I RAILWAYS

More than a decade of experience and 15,000 installations are behind %Proportioneers% complete line of standardized metering pumps for automatic treating, feeding, etc. %Proportioneers% equipment provides automatic chemical feed to produce clear, neutral water for the prevention of incrustation, corrosion, embrittlement and carryover %Proportioneers% units are simple to operate and ruggedly built to withstand severe service with minimum maintenance. • Either of two automatic feeding methods – constant rate or flow proportional – cover all chemical feeding problems.

AUTOMATIC CONSTANT RATE



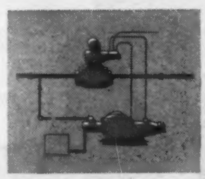


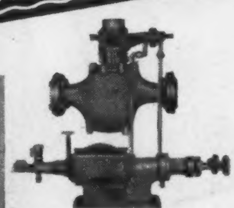
Model 1XSB Midget Series Simplex up to 7.5 GPH, 500 p.s.i.g.

%Proportioneers% Adjust-O-Feeder Chemical Proportioning Pumps for treating at constant rate are built in Simplex, Duplex and Multiplex designs, with capacities up to 40 GPM. All Adjust-O-Feeders have Fluid Sealed Plungers and Stuffing Glands.

Send for Bulletin 1100

AUTOMATIC FLOW PROPORTIONAL





Treet-O-Control Meter and Treet-O-Unit Chemical Pump

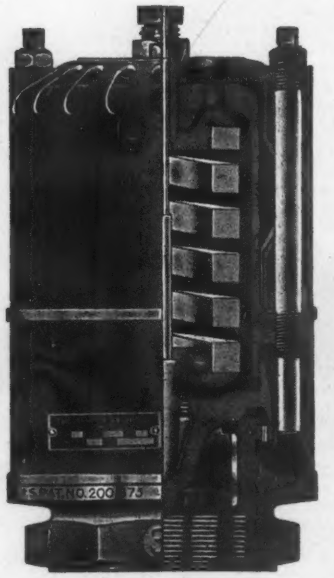
For Flow Proportional treating, %Proportioneers% Treet-O-Unit Chemical Pumps or Vol-U-Meters are meter paced to feed in exact proportion to varying flow. All Treet-O-Units are equipped with Fluid Sealed Plungers and Stuffing Glands which seal moving parts against corrosion, plunger build-up and stuffing gland wear.

Send for Bulletin 1200

Write Today for Railroad Brochure

% PROPORTIONEERS, INC. %

WRITE TO %PROPORTIONEERS, INC.%, 44 CODDING ST., PROVIDENCE 1, RHODE ISLAND

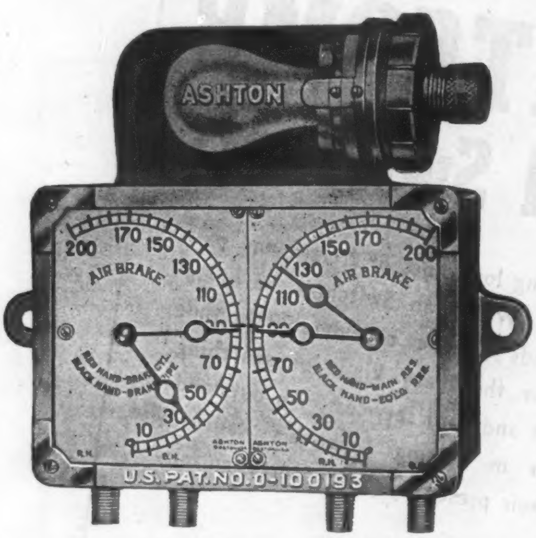


ASHTON FC-10 MUFFLED SAFETY VALVE

The FC-10 Muffled Locomotive Safety Valve was developed to meet the condition of increased evaporating efficiency on high pressure locomotive boilers. It has operated successfully for a period of over ten years in road tests and regular service on locomotives carrying pressures up to 300 pounds per square inch. Throughout this period it has operated without the necessity of the renewal of any parts.

ASHTON NO. 52 DI-3 6¾" DOUBLE DIAL LOCOMOTIVE STEAM GAGE, LAMP HOUSING CAST INTEGRAL WITH CASE

The New Style No. 52 DI-3 Locomotive Steam Gage eliminates the need of separate boiler pressure gages for engineer and fireman. Each face of the Gage has a dial and hand illuminated by a standard electric lamp bulb and can be seen from either right or left side of the locomotive cab. Dial has a permanent white porcelain surface which is positively non-glare and can readily be cleaned.



ASHTON NO. 62 QI-7 QUADRUPLEX ILLUMINATED LOCOMOTIVE AIR BRAKE GAGE. LAMP HOUSING CAST INTEGRAL WITH FACE RING.

The principal object of this new design is to place in a centralized position the two air gages and the indicating hands of same as near together as possible, so that the engineer by concentrating his vision particularly on the brake pipe and equalizing reservoir hands may regulate more uniformly and accurately his brake applications and secure smooth handling of the train.

ASHTON NO. QI-9 QUADRUPLEX ILLUMINATED LOCOMOTIVE STOKER GAGE

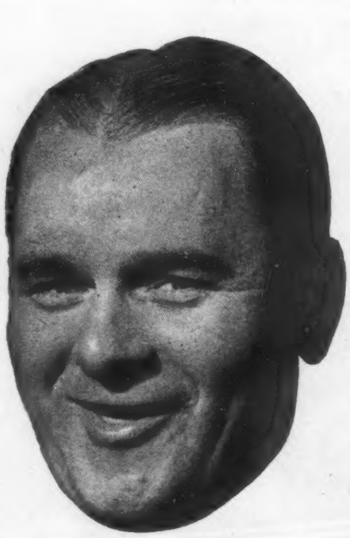
The Ashton Locomotive Stoker Gage is a combination of two duplex gages, ordinarily used in stoker service, mounted in heavy rectangular dust-proof case.

Combining the two gages in one case reduces the space required for this equipment in locomotive cabs. Especially adapted to service on the HT and HT-I stokers or other types where three or four pressure indications are required.

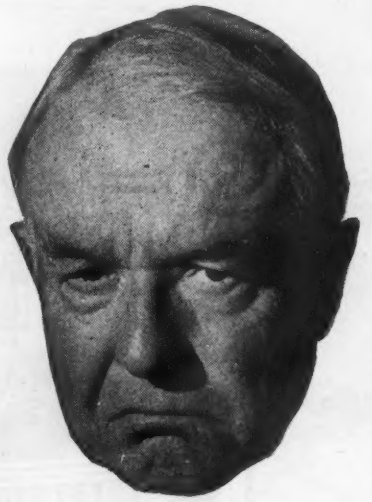
THE ASHTON VALVE COMPANY

161-179 FIRST STREET, CAMBRIDGE, MASS.

CHICAGO, ILL. NEW YORK, N. Y. SAN FRANCISCO, CAL



"I'll tell you GOOD TIMES ARE COMING!"



"I'll tell you BAD TIMES AHEAD!"

What's it to you?–PLENTY!

OKAY! Maybe the optimists are right. There'll be good times after the war.

OKAY! Maybe the pessimists are right. We'll have another depression.

What's it to you? PLENTY! It's largely in *your* hands as to which we'll have.

The one way to make it *good times* is to do your share to help keep prices down now!

That means *buying only what you really need.* It means *paying off your debts, saving your money.*

And here's where you're lucky.

The same program that helps insure prosperity is also the best possible way to get yourself in shape to take another depression if one does come. So what? *You're right both ways*—if you save your money. *You lose both ways*—if you splurge right now.

Think it over, fella. Then get in there and fight. Read—and observe—the four rules to head off inflation. The war isn't over yet. And the war against *inflation* isn't over yet—by a long shot. Remember World War I? The cost of living rose twice as fast *after* the war as it did during the war itself.

4 THINGS TO DO to keep prices down and help avoid another depression

1. Buy only what you really need.
2. When you buy, pay no more than ceiling prices. Pay your ration points in full.
3. Keep your *own* prices down. Don't take advantage of war conditions to ask more for your labor, your services, or the goods you sell.
4. *Save.* Buy and hold all the War Bonds you can afford—to help pay for the war and insure your future. Keep up your insurance.

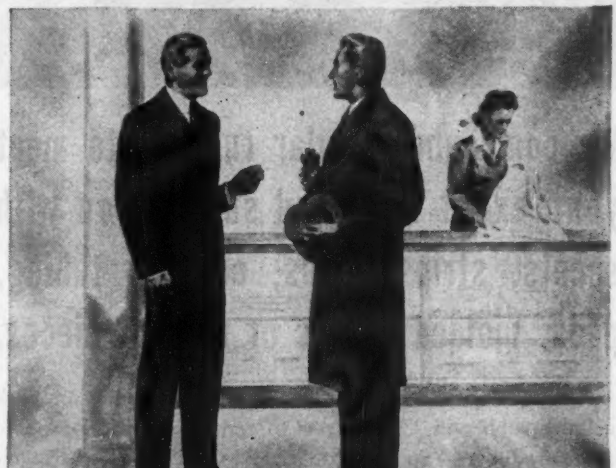
HELP US KEEP PRICES DOWN

A United States War message prepared by the War Advertising Council, approved by the Office of War Information, and contributed by this magazine in cooperation with the Magazine Publishers of America.

1. ***A business man asks . . .***

2. ***A professional man inquires . . .***

3. ***An architect wonders . . .***



4. ***A department store manager asks . .***

Does OTIS still make elevators?

Certainly! We've never been *out* of the elevator business, although our engineering and manufacturing facilities have been working 100% for the Armed Services.

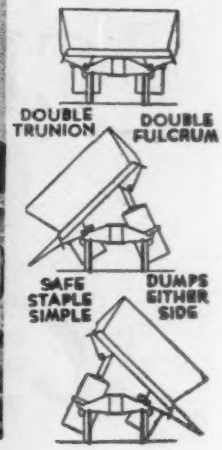
It is true that we have manufactured vast quantities of parts for guns, ships and aircraft for the Army, Navy and Air Corps but, because vertical transportation is essential in the production and handling of munitions of war and in the operation of aircraft carriers, we have continued to produce a large volume of passenger, freight and special purpose elevators.

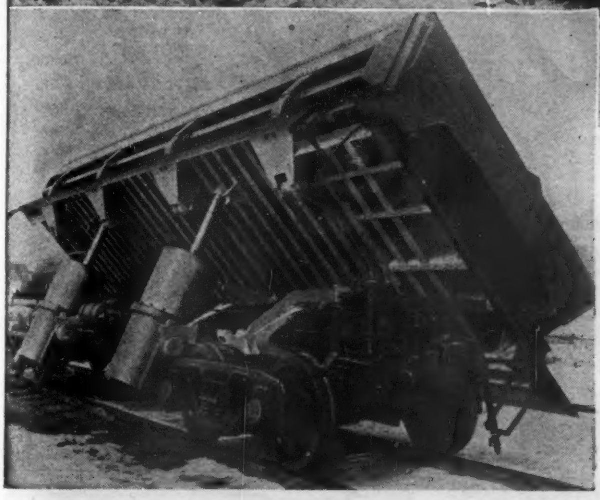
We have been too busy producing war goods to say much about the future — but

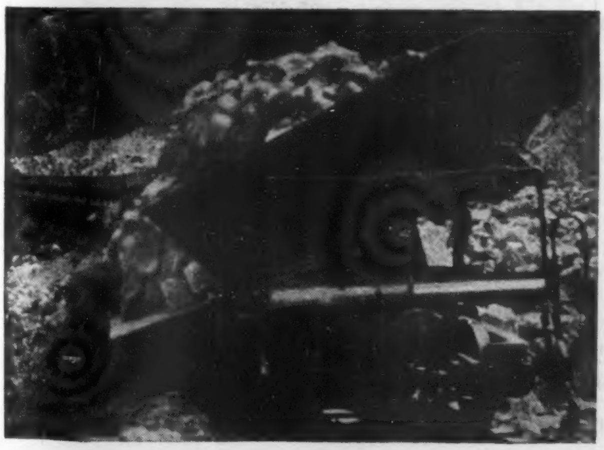
Now — representatives in our 244 offices are ready and waiting to work with architects, engineers, and owners in the preparation of surveys, plans and estimates on new elevator installations or the modernization, repair or maintenance of existing facilities.

Your action now will expedite future deliveries. Production will begin as soon as material and labor are no longer required for war goods.

Otis ELEVATOR COMPANY
BRANCH OFFICES IN ALL PRINCIPAL CITIES







DIFFERENTIAL AIR DUMP CARS

(PATENTED)

DIFFERENTIAL AIR DUMP CARS are constructed to withstand severe loading and dumping conditions. Powerful air cylinders assure quick and positive dumping to either side. The double fulcrum principle as shown in the diagram supports the dump body on widely spaced fulcrums and there is no rocking or swaying in transit. Locking mechanism is eliminated and there is no chance for accidental dumping. Operation of side door is automatic and the load is deposited at an extreme distance from the track. The doors are held positively closed by the weight of the body and its load.

DIFFERENTIAL RAIL CARS

(PATENTED)

Differential Rail Cars are powered with four gasoline engines that deliver 500 HP to eight wheels. AXLESS Trucks permit independent rotation of wheels eliminating slippage and noise on curves.

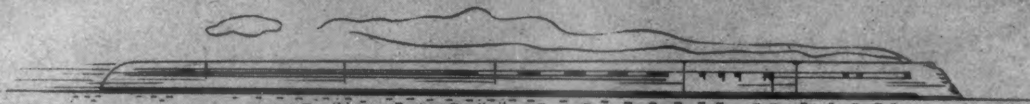
DIFFERENTIAL STEEL CAR COMPANY

FINDLAY, OHIO, U. S. A.

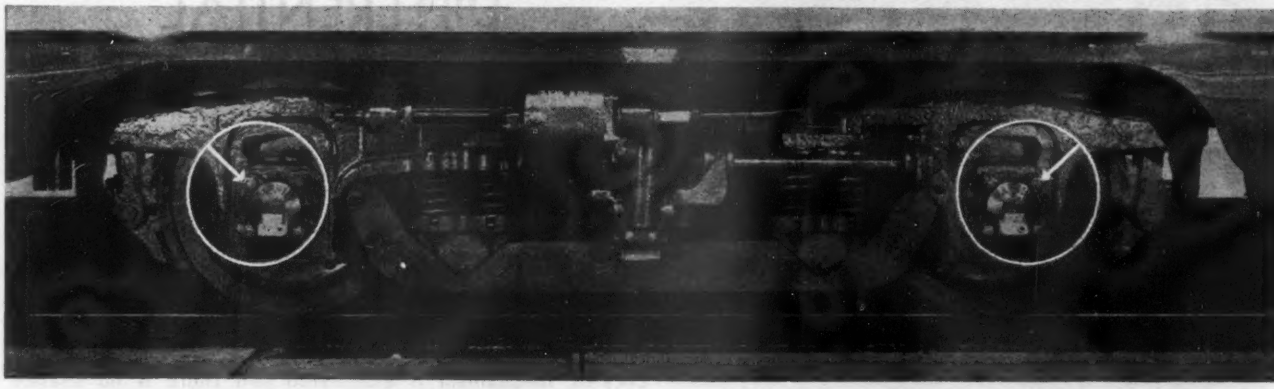
Builders of Haulage Equipment Since 1915

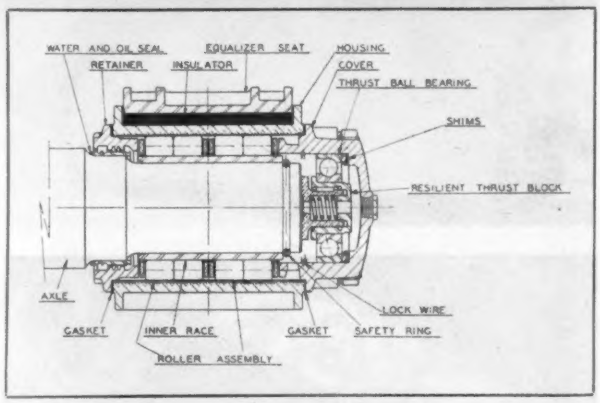
AIR DUMP CARS — MINE CARS — MINE LOCOMOTIVES — ROCK LARRIES — DUMPING DEVICES
BURDEN-BEARING LOCOMOTIVES — STOCKPILING CARS — COMPLETE HAULAGE SYSTEMS

Click off a



COOL 80 M.P.H.





Fafnir Ball and Roller Journal Bearings assure Positive Lubrication at All Speeds . . . . .

Fafnir Ball and Roller Journal Bearings are designed for easy starts and fast hauls . . . for positive lubrication at all speeds. They seal out dirt and water . . . seal in lubrication . . . cut maintenance costs to the bone! This lubrication efficiency has been proved over millions of miles of service on many of America's crack trains.

Fafnirs are furnished for either grease or oil lubrication . . . but grease lubrication is recommended for its exceptionally low cost maintenance . . . ½ pound of grease every 60 days!

Adaptable to Standard AAR pedestal openings . . . and inner rings do not have to be removed at wheel-turning periods. The Fafnir Bearing Company, New Britain, Connecticut.

ARMY E NAVY

BUY WAR BONDS AND STAMPS

FAFNIR BALL & ROLLER JOURNAL BEARINGS

REDUCE STARTING LOADS UP TO 90% . . . CUT MAINTENANCE COSTS TWO-THIRDS

A SUGGESTION TO RAILROAD EXECUTIVES

ELMER SAYS:
. . . Post-war cars should have new and advanced lighting systems engineered as a part of the car.

VISIT the Luminator Lighting Laboratories now . . . you'll see the newest in advanced lighting systems for cars. Luminator specializes in Railroad lighting problems . . . presents the results of this study in full size car interior models. You will witness demonstrations of new methods of interior car lighting.

Cheerful interiors, free of dazzle and glare, plus both fluorescent and incandescent lighting systems designed to blend harmoniously with car interiors will help to build passenger good will.

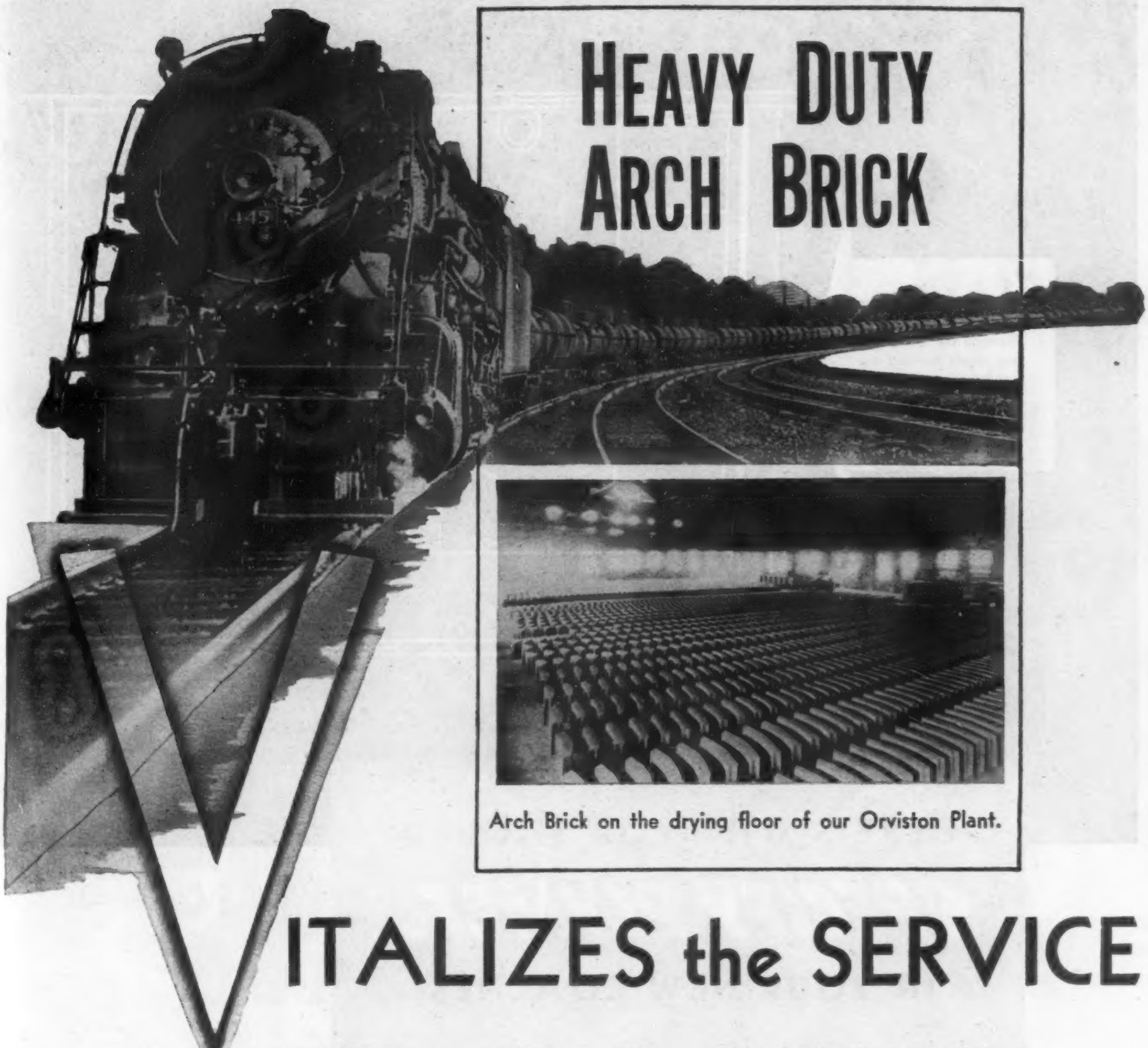
For the latest developments in the "Science of Seeing" come in and visit the Luminator Lighting Laboratories. Ask your friends who have been here. They'll tell you it's worthwhile.

LIGHTING ENGINEERS · DESIGNERS · MANUFACTURERS

LUMINATOR inc.

120 NORTH PEORIA ST., CHICAGO, ILLINOIS
IN CANADA: RAILWAY AND POWER ENGINEERING CORP

HEAVY DUTY ARCH BRICK



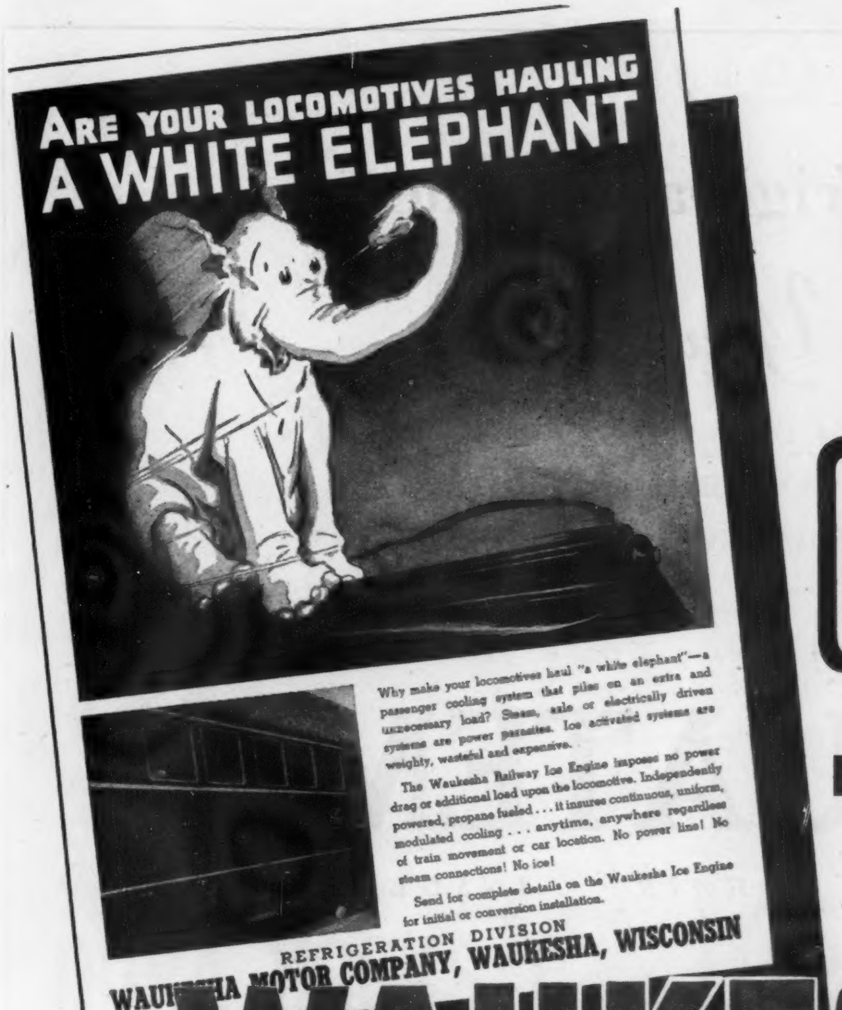
Arch Brick on the drying floor of our Orviston Plant.

VITALIZES the SERVICE

THE intensive utilization of locomotives under heavy war loads demands a Heavy Duty Arch Brick which will stand up and take it when the going gets hot. Long experience has demonstrated that locomotives equipped with GENERAL REFRACTORIES Heavy Duty Arch Brick are outstanding for their high revenue mileage between arch replacements. And there's a very good reason for this exceptional service. Complete control of every production phase including the supply of raw materials and the use of modern facilities insures not only maximum service from GENERAL REFRACTORIES Arch Brick but a big saving in the cost of locomotive operation and maintenance.

GENERAL REFRACTORIES COMPANY

Philadelphia 7 RAILWAY DEPARTMENT Penna.



10 Years Operation

have TESTED and PROVED IT!

WAUKESHA

ENGINE-DRIVEN *Equipment*

In 1935, one railroad started operating one coach with Waukesha engine-driven equipment . . .

And *Railway Age* in its Sept. 14, 1935 issue carried an article about it, headed "Air Conditioning with No Locomotive Power Drag" . . .

Or, as one of the early Waukesha advertisements so aptly puts it—"Why make your locomotives haul a white elephant? . . . an extra and unnecessary load. Steam, axle or electrically driven systems are power parasites."

Right! Then . . . *and now!* In ten years . . . and more than 25,000,000 miles of operation on famous-name trains and twenty-five major American railways including the Pullman Company . . . Waukesha Engine-Driven Air Conditioning and Generator Units have been tested *and proved* beyond question!

There's no parasite load—all the locomotive's horsepower, formerly diverted to air-conditioning and electric services, is available to pull the train. Waukesha engine-driven units completely take over—supply modern deluxe air conditioning and lighting *on demand*—independent of train movement, weather conditions or car location.

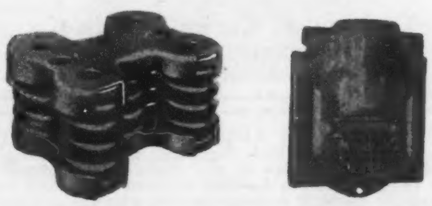
Find out how Waukesha can give your trains added pay-load, faster schedules, lower operating costs. Details sent without obligation.

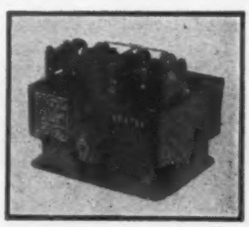
REFRIGERATION DIVISION

WAUKESHA MOTOR COMPANY • WAUKESHA, WIS.

LARGEST BUILDERS OF MOBILE ENGINE-DRIVEN REFRIGERATION AND GENERATOR EQUIPMENT


"THERMOSWITCHES"
ACCURATELY CONTROL
UNIT TEMPERATURES





Buy
War Bonds

INDEX TO ADVERTISERS — JANUARY 6, 1945

945